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Some Reflections on Agricultural Geography

Address to The Geographical Association

R. OGILVIE BUCHANAN

President 1958

THE ADOPTION OF A RULING THEME that will give character and continuity to the Conference, so happily exemplified by the contributions in 1956 to the geography of London, and in 1958 to urban geography, proved so successful that I welcomed the Honorary Organizer's suggestion that the theme this year should be agricultural geography and that the presidential address should be an introduction to that theme. I hasten to confess that I was moved not only by the appropriateness of the subject to a Conference such as this, but also by my own professional interest, which, no doubt reflecting a youth spent in close touch with practical farming, has acquired a somewhat pronounced bias to this aspect of our subject.

The task, however, is by no means easy. Agriculture is something of a portmanteau word, including within its denotation a wide range, from very simple to highly complex, of systems of utilizing the soil for the production of food stuffs or raw materials for human use. Clearly any comprehensive treatment of the geography of agriculture is beyond the scope of an address of this kind, and I intend, and have indicated my intention in the title, to be selective both in the material to be treated and in the method of treatment.

The first limitation, then, to be imposed upon the scope of the term "agriculture" for my present purpose is that implied in the well-worn descriptive tags, "agriculture as a way of getting a living" and "agriculture as a way of life". "A way of life" clearly implies that agriculture is something more than merely an industry. It does not, and cannot, cease to be an economic phenomenon, but it extends far beyond the merely economic into the wider social aspects and organization of life. So intimate indeed is the relationship between the agriculture and the character of social institutions and customs that it becomes virtually impossible to decide which is cause and which is effect. With only local and temporary exceptions, agriculture of this kind has been universal until very recent times, is still characteristic of areas of subsistence production, and is far from negligible in areas of small peasant agriculture that are not wholly subsistence agriculture areas.

➤ Professor Buchanan delivered his address at the London School of Economics on 30th December 1958 during the Annual Conference of the Association.

In passing, one may note that it is precisely because the agricultural system was so closely tied into the wider social activities and values of the peasant communities in Russia and eastern Europe that the resistance to collectivization of farming in these areas was so bitter and so prolonged. The economic incentive to resistance was strongly reinforced by the social objections of the villagers.

So long as agriculture remains at this stage, where the strength of custom and its matching social institutions in a community prevent the free play of purely economic considerations, the geography of agriculture is properly an exercise in social geography. Geographical studies of agriculture of this kind have attracted geographers only to a minor degree. Much good work has been done by social anthropologists, but their interest has naturally been focused usually on the more primitive communities and on the techniques and processes of agriculture in the setting of the social organization of the group. I should be far from suggesting that the influence of, for instance, religious beliefs and practices or other aspects of the social organization of primitive communities on their agricultural methods and the reflex effects of the agricultural conditions and methods on their beliefs and institutions are not properly to be called geography. All that I am suggesting is that they do not exhaust the job of the geographer in studying the agriculture of such communities, and that, broadly speaking, the geographer has perhaps contributed less to the advancement of this sector of his subject than has the social anthropologist.

At this point I hasten to exclaim "*Mea culpa!*", to confess that I have myself done nothing to forward our knowledge of this part of our subject, and that for the rest of this address I shall be devoting my attention to some aspects of the other broad division, agriculture as a way of getting a living. By way of preliminary precaution let me hope that you will not regard my distinction too rigidly. To the extent that it is true that there are areas and systems of agriculture in which the farmer, the farm worker and society in general do in fact regard farming simply as a way of getting a living, farming becomes purely an industry like any other—coal-mining, steel-making, light engineering or what not—but such complete conversion of farming to a purely economic facies is still far from universal, and over much of the modern commercial world and in most of its agricultural systems some lingering elements of the social traditions of a bygone age still survive. There is nevertheless a sufficiently wide-spread and sufficiently close approximation to a fully commercialized agriculture to justify its examination as a modern industry, or, more accurately, as a pretty considerable group of industries.

The first point to make, then, about this modern agriculture is that it *is* modern, modern in origin as well as in character. True, there were forerunners, some of them in the very distant past, as, for instance, the Roman *latifundia*, which were highly commercialized units. In

England the Tudor enclosures for sheep-rearing, capitalizing on the demand for wool from the Continent and from England's own rising woollen manufacturing industry, and compensating for the decline in manpower brought about by the Black Death and still not made good, produced working units which were in all essentials prototypes of the Australian sheep runs of the early nineteenth century. Perhaps most immediately relevant to our present purpose was the overseas plantation unit, a form of organization invented in the sixteenth century and developed in the seventeenth, which, modified in various ways, is still a live and vigorous element of contemporary large-scale commercial agriculture. Nevertheless, despite these and other examples of earlier commercial organization, we may with some confidence date the beginnings of the present systems of commercial agriculture to the eighteenth century, when the agricultural and the industrial revolutions of that century initiated changes that have gone on at an accelerating rate ever since.

Perhaps the key element in the new agriculture, as in the new industry, is to be found in specialization. Not only did agriculture as a whole become more sharply differentiated from manufacturing industry, with the increasing dominance of the factory and the mine, but new specializations of function or personnel (Adam Smith's 'division of labour') arose within agriculture itself. This process, in agriculture as in industry, when carried to its logical conclusion results in specialization of area, a term which expresses the geography of what the economist has in mind when he says "localization of industry". In this connection it should perhaps be emphasized that specialization of area in agriculture is no more to be confused with monoculture than, for instance, the specialist cotton-manufacturing area of southeast Lancashire is to be thought of as manufacturing cotton textiles and nothing else. The Australian sheep area, the New Zealand specialist dairy-farming regions, the coffee belt of Brazil, the rubber areas of Malaya may well exemplify extreme concentration on a single product, but the Corn Belt of the United States, still more the mixed farming area of East Anglia, have no such limitation, while in Denmark we find a most beautifully designed pattern of an intensive long-rotation arable agriculture focused primarily on the support of dairy cows for milk, and through them on the production of bacon and eggs. There is no more highly specialized commercial agricultural area on earth, though it is by the system rather than by the product that it is characterized.

Not surprisingly the longest strides to extreme specialization of agricultural areas were taken in the earlier nineteenth century in some of the areas of new colonization overseas. The plantations and the Australian sheep runs have already been mentioned and examples need not be multiplied. The essence of their economic position lay in the fact that land was normally plentiful and cheap, while extreme scarcity of labour was reflected in very high rates of wages. Efficient use of labour demanded systems of farming that would spread labour thinly over much land and give a high return per unit of labour, though normally this would be accompanied by a low yield per unit of area. This, by the way, is irrespective of whether the labour is hired or is that of independent working owners or tenants. Clearly this is most easily realized where both the land and the labour are severely specialized and a monoculture holds sway. The late nineteenth- and early twentieth-century character of the Spring Wheat Belt of North America illustrates this very well. In recognizing this influence of some of the overseas areas as leaders towards specialization of area, however, one must guard against the danger of under-estimating how much such specialization of area, though not always of product, was concurrently being achieved in Britain and northwest Europe, where much larger labour supplies with lower wages rates and a long-established tradition both acted as something of a brake on the progress to specialization. As in our Danish example, it is easier to gain a relatively accurate idea of just how much has been accomplished if we think of systems of farming rather than of single products.

The world pattern was pretty well established by 1900, though it is true that new settlement has expanded somewhat since then and new areas of specialist production have come into existence. That pattern can best be described as a mosaic, not always completely continuous, of areas of specialist agricultural production. Such a mosaic implies a world market that is effective both over the total area in question and over a considerable range of demand. The great development of powered transport media (rail, marine, road, air), which geographers seldom forget, was instrumental in bringing the far ends of the earth into effective touch with one another, and in permitting the essential and constant outflow of products and inflow of requirements. What is more commonly overlooked is that the commercial and financial aids, the produce markets, futures markets, convertibility of currencies, the bill on London, discount and insurance facilities, low tariff walls and so on, were just as essential as the physical aids to movement of goods. The system works much less smoothly now in an era of non-convertible currencies and of much more pronounced economic nationalism than it did pre-1914, but the continued vigour of world trade originating and terminating in such specialized regions gives evidence of powers of survival of the pattern, reflecting its efficiency as a productive system.

If this picture is even approximately accurate and adequate, it will follow that the task of the economic geographer is to establish the pattern and to interpret it. Establishing the pattern means finding the most precise boundaries possible to the individual regions, and interpreting it means assessing the effect of the various local physical, economic and historical conditions in the context of the world market, including physical and economic access to the world market. To a newcomer to the work it might well seem that interpreting an area in that sense might be very difficult, but that establishing it should be easy. In fact both problems may be very difficult, and in general a study of the published work suggests that the logical problems involved are seldom well understood, or at any rate demonstrably solved.

Establishing the pattern of agricultural regions, as we have just said, involves finding the best possible boundaries to the individual regions, which in turn implies both definition and delimitation. My first proposition is that definition must be in agricultural terms—a crop, a crop association, a crop-and-livestock association, a system of organization of farm processes will serve as convenient examples. It is, unfortunately, necessary to stress this point. It is a curious fact that geographers at large have a quite clear understanding in their studies of climate of the difference between "elements" and "factors", but the exactly corresponding difference between the nature of a region and the factors that go to the creating of that nature is quite often not appreciated. So, for the Spring Wheat Belt of the United States and the Canadian Prairie Provinces the criterion is spring wheat, just that and nothing else. For the Cotton Belt it is cotton, for the Wheat-Alfalfa-Cattle Crescent of the Argentine Pampa it is wheat, alfalfa and cattle as an association. All of these, taken from the agricultural field, are simply examples of the wider rule that economic regions are defined in terms of economic criteria, and of the over-riding general rule that definition seeks to express the irreducible minimum of the inherent character of the phenomenon to be defined, so that all other attributes can be derived from it.

Delimitation, the actual fixing of a boundary, implies that the criterion or criteria must be capable of being mapped. On the large scale this means capable of being observed on the ground and recorded on a map of appropriate scale. Where, however, a considerable area, too great for direct field mapping, is being brought under review, it implies that the criteria can be expressed in quantitative, essentially numerical, form and recorded on small-scale maps. Such statistical mapping is of course open to sample field checking, and its final acceptability depends upon its ability to face such field checking, allowance being made for the degree of generalization necessary to fit the scale.

A long step forward in mapping and studying agricultural regions was taken by O. E. Baker in his work "The Agricultural Regions of North America", published as a series of articles in *Economic Geography* from 1926 onwards for several years. This was in the strict sense a small-scale investigation of a whole continent and of regions some of which were already recognized under specific names in lay usage. His materials for mapping were the county statistics. The counties themselves were sufficiently small and the statistics sufficiently detailed and reliable to be adequate to the scale of the work. His task was to give a degree of precision, previously lacking, to the boundaries of the various belts so established. I propose to look more critically at part of his work in a moment or two, but before doing so I should like to make one or two general comments. In the first place, presumably through the initiative of the editor of *Economic Geography*, then the late Professor Elmer Ekblaw, that journal published further series of studies of agricultural regions, covering all the other continents. It is no disparagement of the authors, Olaf Jonasson, Clarence F. Jones, Samuel van Valkenburg and Griffith Taylor, to say that not one of those series was as successful as Baker's; neither the continents themselves nor the statistical data available lent themselves as readily to the work. Nevertheless this very considerable body of published studies of agricultural regions, covering the whole world, was a very significant addition to the literature of agricultural geography, and may well be seen in retrospect as the greatest contribution of *Economic Geography* to our subject.

In the second place, the criticism put forward by Derwent Whittlesey[1] that Baker's system, however useful it might be in the study of North American agriculture, was merely an *ad hoc* method that could not be used for the world as a whole or for a comparative study of North America with any other continent should not be over-emphasized. It is true so far as it goes, and Whittlesley himself evolved a somewhat complex method of dealing with agricultural regions on a world basis. In so far, however, as Baker's method and his system of agricultural regions materially aided in appreciating the regional character of American agriculture it was of inestimable value to students of the subject.

From the point of view of an economic geographer, however, there would seem to be some methodological weaknesses, or at any rate some lack of logical rigour in Baker's work. He is on quite firm ground in his delimitations where the problem is to find the outer boundaries beyond which a particular crop is not cultivated at all. The northern boundary of his Cotton Belt and the south-western (semi-arid) boundary of his Spring Wheat Belt are instances in point. In such cases the problem is simple and the method cannot fail to be fully objective. Wheat or no wheat, cotton or no cotton, is all that has to be observed and mapped, and a boundary, firm for any particular point of time, though subject no doubt to advance or retreat over a period of time, can be fixed.

The Corn Belt presented a different problem. Corn is the most widely grown crop in the continent, extending from Canada to the Gulf of Mexico, from Kansas and Nebraska to the Atlantic coast, and even, by special methods, far into the dry southwest; and what was required was a valid method of accurately distinguishing the area of corn-growing par excellence, *the* Corn Belt. For this task Baker's basic definition and his consequential criterion for delimitation are either unsatisfactory in themselves, or, if not, are quite inadequately explained. "This region", he says, "includes that portion of the east central United States in which corn (maize) is produced in great quantities and is more important than any other crop." If he had stuck strictly to that definition, he would surely have had to include in his Corn Belt much, if not all, of his Corn and Winter Wheat Belt, where corn in point of acreage and yield is quite generally more important than any other single crop. If, as has been suggested, what he really meant was the area within which corn was the dominant[2] crop, in the sense that the whole farm organization focused on corn and that other crops were grown not so much directly for their own sake as to provide a suitable rotation, he would have had a formula sufficiently rigorous to enable him to separate out that part of the corn-growing area in which corn occupies a different position from what it does anywhere else. It was probably something of this kind that Baker did mean—but he did not say so.

His next problem was to find a quantitative measure of relative importance of corn that could be mapped. On this he says, "In all counties of the region, except those along the semi-arid western margin, the average annual production of corn per square mile exceeds 1000 bushels, and in a few counties reaches 10,000 bushels and more. The yearly average production along the southern margin is 3000 bushels per square mile and this is generally true also along the northern and eastern margins. On the average the Corn Belt produces 5000 bushels of corn per square mile. . . ."

Here we face a logical problem of method that Baker gives us no help in solving. We are not told by what process he arrived at the figure of 3000 bushels, and in view of the fact that he says "this is generally true also along the eastern and northern margins", we are even left in doubt whether, having decided on that figure, he applied it strictly. It is, I think, a not unfair inference from the statement, "the average production along the southern margin is 3000 bushels per square mile", that Baker may have drawn his southern boundary on some other basis, and then noted the correspondence with the 3000 bushels per square mile yield. And this deduction draws more than a little support from the footnote to Baker's first article "The Basis of Classification".[3] If that were so, and we have no means of knowing whether it were so or not, his correlation of the southern boundary with certain features would be logically valueless, being based on reasoning in a circle.

At this stage it may be well to indicate how an appropriate boundary to the Corn Belt may be validly found. On the criterion of dominance of corn in the sense already defined, what has to be done is to find whether that concept can be translated into terms of bushels per square mile, and, if it can, to find the proper number of bushels for the limiting case. Now the Corn Belt as a fact and the name "Corn Belt" had been in existence for years before Baker began his work.[4] No one previously had attempted to give any precise extent to it, and the kind of general idea that was prevalent is shown very well by an extract from the 1911

Yearbook of the United States Department of Agriculture, quoted by Warntz: "For the purposes of this paper the Corn Belt will be considered as including the States of Ohio, Indiana, Illinois, Iowa, Missouri, Kansas and Nebraska, together with southern portions of Michigan, Wisconsin, and Minnesota, the south-eastern portion of South Dakota, and the western half of Kentucky."

Vague as this description is, it does give some indication of approximate boundaries, and a rigorous procedure would have been to do a farm-by-farm investigation along a series of transects from well outside the approximate boundary to well inside it. Such an investigation would have permitted the establishment on each transect of the point at which corn ceased to be the focus of the farm organization and became only another, even if a very important, crop. If the number of transects were impossibly numerous, there would be no need for any statistical evaluation: the points could be simply joined up to give a firm boundary. Within the practical possibilities the transects would be no more than samples, but the position of the points would permit an evaluation of the number of bushels per unit area that would serve as a statistical index. It might or might not be found that the actual value varied from one part of the belt to another, as, for instance, from the southern boundary to the northern.

Once such a numerical evaluation has been made, it must be mapped on a map which contains nothing at all except the county boundaries to which the statistics relate, in practice a tracing overlay. It is then possible by the ordinary procedure of superposition to relate it to a range of maps showing, for instance, isohyets (annual, seasonal or monthly), isotherms, relief, soil boundaries, geological outcrops, drift deposits and so on. Here one might interpolate that the process need not stop there. Maps showing population distribution and density, types of land tenure and other human distributions may also be relevant and important. By such a process the correspondences noted by Baker of the southern boundary of his belt with the southern edge of the Wisconsin glaciation east of the Mississippi and with the northern foot of the Ozark Plateau west of the Mississippi; of the eastern boundary with the westward-facing bluffs that mark the western edge of the Appalachian Plateau; of the northern boundary with the line of 70° F. mean summer temperature east of the Missouri and 69° F. west of that river would have validity as firm correlations, established *after* the extent of the belt had been fixed. At the risk of tedious repetition I stress the general point that no correlation can have any value at all unless the variables it relates are completely independent. The accuracy and validity of Baker's correlations are not at the moment in question: they may be thoroughly sound. All that is argued is that he has given us no means of knowing whether they are sound or not, and that he leaves us with something of an uneasy suspicion that his method was not sound.

This matter of correlation leads me to a further point of what I may call the scientific method of the problem. Having established his correlations (if, that is to say, they *are* correlations, and the belt has not been delimited by mapping the physical elements, the Wisconsin glaciation and so on), Baker has no difficulty in showing that in this belt corn finds better conditions for growth and yield than in any other part of North America. Soils change progressively from forest brown earths in the east through black prairie earths and then chernozems to chocolate and lighter-coloured grassland soils in the west, but are everywhere good and on the grassland area outstandingly good. Length of growing season decreases pretty regularly from south to north, but along the northern boundary the mean summer temperatures indicated as good signposts correspond pretty closely to a frost-free period of 140 days, and that was long enough for the types of corn grown in Baker's day. Rainfall decreases progressively westward and becomes the critical element in the west. Up to that point, however, it is both adequate in mean annual amount and most conveniently distributed seasonally, with a relatively large amount in July and August, just when it is most required by the plant for a good yield. The smoothness of the surface greatly aids ease of cultivation, and the winters are severe enough to constitute a useful check on the multiplication and spread of pests. All that is true, but it still falls a good deal short of explaining why corn becomes dominant in the belt. This great area of country is also the best area in North America for the growing of various other crops, but not one of them achieved supremacy.

In this context it is illuminating to contrast the experience of the Spring Wheat Belt, at any rate in its northern part, including the Canadian portion of the Red River valley. In the early stages of settlement only a small fraction of the present Canadian Spring Wheat Belt was suited to the growing of wheat, and only to the most rapidly maturing variety. The area was in fact more widely and more completely suited to barley than to wheat, and it was only by breeding special varieties of wheat, tailored as it were to the climate, that the Canadian Spring Wheat Belt could become the Spring Wheat Belt and assume its present extent and character. The crop best suited to the conditions of rainfall and length of growing season, barley, did not dominate the farming or the region itself, but was outdone by one that had to suffer considerable modifications to enable it to do so. It is interesting to note, however, that in the changed market conditions of more recent years barley has made considerable headway, especially in the Red River valley of Manitoba. (Amongst ancillary advantages for this is the fact that its earlier harvesting dates allow a more thorough war on the weeds that wheat monoculture had encouraged.)

The truth is that, even accustomed as we now are to supplying our wants by buying and selling, we geographers are still prone to overlook the fact that it is consumer demand, direct or derived, as expressed in the state and trend of markets, against which the claims of a product to utilize a particular set of physical conditions must be viewed. The crop that best fits the physical conditions will be the preferred crop if, and only if, its advantage in physical yield over its competitors is reflected in an advantage in financial yield. That may well be normally the case; it is not necessarily so. The rise of corn to its dominant position in the later nineteenth century is to be set in the context of the rapidly rising demand for meat and perhaps especially for animal fats in the days before vegetable oils had made any significant advance as substitutes for butter and cooking fats. Famous as was, and is, the Corn Belt for the fattening of beef cattle, it is the lard hog that has been its peculiar contribution and the lard hog that most efficiently used the supreme fattening capacity of the maize in a rapid turn-over of stock. Directly contributory, too, was the development of lake shipping and the vast proliferation of railways about the middle of the nineteenth century, widening the home market and opening up international markets before the Cotton Belt or the great pastoral countries of the Southern Hemisphere were able to compete. In summary it was the sustained demand from accessible markets for corn-fed livestock products, constituting a derived or indirect demand for corn itself, that kept the price of corn per bushel broadly similar to that of wheat, while the yield per acre of corn in the Corn Belt was normally twice that of wheat, or more, and this relationship of wheat to corn epitomizes the net effect of the manifold outside influences to which the Belt and its agriculture were deliberately adjusted. Analysis of these and other aspects of the nearer and the wider economic environment forms no part of Baker's work or purpose. Baker's descriptive treatment of the Corn Belt as a going concern stands unrivalled, even by other parts of his own work, but should, it would seem, better be regarded as a contribution to regional than to economic geography.

This brings me to the final point arising out of Baker's work. Baker himself suggested that his boundaries might not themselves be permanent, and I have myself elsewhere discussed the geographical margin as one aspect of the lack of fixity of boundaries.[5] In the Corn Belt we have a more complex example, arising not only out of shifts in demand occasioned by events elsewhere, but also by alterations in supply conditions within the belt itself. In the first place the breeding of more rapidly maturing varieties of corn has had the effect of enabling the northwest boundaries of the belt to be pushed outwards in Minnesota and South Dakota. That is a simple extension of area, an outward movement of the margin, and does not of itself necessarily involve any change in the criterion or any recalculation of the numerical value assigned to the criterion.

Apart, however, from such biological changes, simple intensification in the demand for maize might well result in an increase in the amount of production of maize wherever it is grown in the United States, and along with that general increase might go either an increase or a decrease in the disparity between the Corn Belt and the rest of the producing area in the amount of production per square mile. The critical amount might then alter up to, say, 4000 bushels, or down to, say, 2500 bushels, with or without any significant change in the position of the boundaries themselves; and similar reasoning can be applied to a prolonged decrease in demand.

Such a simple sequence would of itself involve no change in the character of the belt, a point I shall return to later, and only relatively slight changes in its extent. In fact the actual trend of events has been complicated by other considerations. Here, as elsewhere, there has been a continuous intensification of urbanism, and the constantly increasing urban populations, largely but not wholly on the periphery of the belt, have required increasing supplies of dairy produce and market garden produce, most of which has to be produced locally. So the belt has been progressively bitten into by expanding areas devoted to the production of other things than corn, with a corresponding decline of corn-growing. Small as these areas are in total extent and in their proportion to the belt as a whole, they do something to alter the beautiful simplicity of outline of the belt and to remind us that corn-growing in the Corn Belt, no less than elsewhere is still dependent on the ability of the corn to hold its own in market value against the competition of other possible products.

More widespread and more continuous, however, is another change which has come about wholly since Baker was doing his work in the early 1920's. The rise of the vegetable oils as sources of margarine and cooking fats and of mineral oils as substitutes for animal fats in most of their other uses has greatly decreased the demand for lard and therefore for the lard hog. In compensation, however, it was discovered that the general physical and climatic conditions that are differentially good for corn are also differentially good for that recent vegetable oil seed immigrant into the United States, the soya bean. The great spread of soya bean growing shows the belt adjusting itself to a decrease in demand for its particular kind of animal fat and a growing demand for vegetable fats. In so doing it is altering its internal character[6] independently of and additionally to any fluctuations of the margins induced by new varieties of corn or by trends in price of corn or in cost of its production.

You may well by this time have begun wearily to wonder why I have devoted so much of my time and argument to a piece of work that is now more than thirty years old, and perhaps to feel that flogging this dead, or at any rate retired, horse is sheer waste of your time. There is indeed more to it than just corn-growing, and I deliberately chose the Corn Belt as a peg to hang a hat on because it illustrates so admirably the general points I want to leave with you about the nature of agricultural geography in a commercial world. In the first place commercialized agriculture does in fact express itself regionally in our present-day world and the definition and the delimitation of agricultural regions demand rigorous concepts and methods, demands which because the logical problem involved is not always understood are not always satisfied even now.

As a corollary of that it would seem to follow that satisfactory delimitation of agricultural regions, even if accompanied by a good descriptive treatment of the current system of agriculture, is strictly an exercise in regional geography rather than in economic geography. It does indeed contain much of the material for a study in economic geography, and may well be an essential step on the road to an adequate study in economic geography, but, without an analysis of the economic conditions, local and general, against which the specialization developed and to which it is adapted, it lacks the essentials of a study in the systematics of economic geography. Account must be taken of demand, which originates essentially outside the region and expresses itself in a general world price with appropriate local modifications. It is the ratio of local costs to this available price that indicates the desirability of the particular specialization. In more technical and general form this means that correlations are established at the margins, but that, even if completely valid, they solve no problems. They are in fact no more than a revealing and a defining of the problems, and themselves become the subjects of the investigation. Their value for this purpose arises in no small part from the fact that it is at the margins, the limiting instances of the forces involved, that they are established.

The other broad characteristic of the agricultural region and its specialized products or methods is its tendency, once established, to maintain itself. The very existence of such a specialized area implies the accumulation of much specialized fixed capital—in our Corn Belt, for instance, corn silos, corn pickers, pig sheds, cattle yards and so on—and of knowledge and skills peculiar to the particular form of production practised. It implies, too, a whole host of commercial and financial institutions ancillary to the special production, their efficiency, like that of the farmers themselves, deriving from long and intimate experience of handling the special product. It implies, finally, developed channels of communication, contacts, reputation. Not one of these categories of equipment will be sacrificed willingly and the attendant losses accepted. The specialized area, like the specialized worker, will fight to the last ditch before accepting a change in specialization, and stability of character, except perhaps at the margins, is a natural, almost inevitable, result. Demand, it is true, keeps on altering, but changes in demand are normally gradual and time is available for the specialist area and its personnel to adjust themselves little by little to the changes. So, though the regions are certainly stable, they are just as certainly not static, still less stagnant. Sooner or later persistent pressure of a permanently changed demand would ensure that a specialized area either changed its productive character or was abandoned. The present pattern of agricultural regions reflects events of the recent past in the growth and spread of white populations and in their application of scientific research, technological achievement and commercial organization to the business of farming. In all of these change is constant, and the Corn Belt, related to a particular phase, now passing away, of the opening up of North America, and to a particular stage, now being left behind, of Western economic evolution, may well be a portent of the replacement in some more or less distant future of the existing world pattern of agricultural regions by new regions and a different pattern.

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England's Diminished Hop-acreage

D. C. D. POCOCK

THIS ARTICLE TRACES the historical geography of one of England's most localized and specialized crops, before attempting some explanation of the present position and a consideration of the future. Hop-gardens or yards—never fields—cover only 0·1 per cent of this country's total area of crops and grass, but are significant in that working costs and labour requirements per acre are higher than those for any other crop. To the geographer the permanent pole and wire framework of the gardens, together with the accompanying features of oasthouses, pickers' huts, protective hedges and associated copses, provides a distinctive set of landscape features forming what might be termed a "hop country".

> "Hops, reformation, baige and beer
> Came into England all in a year."

Although hop cultivation was introduced from Flanders several decades before the traditional date of this rhyme (1524), hops are not mentioned in public statutes until the second half of the sixteenth century, and no reliable statistics* are available for the first two hundred years of hop-growing.

First records at the beginning of the eighteenth century show that there were about 20,000 acres of hops in this country, a figure which rose to 35,000 acres by 1800. An accelerated increase after the middle of the nineteenth century produced a peak of over 71,000 acres in the year 1878. There followed a sharp decline until 1932, when the Hops Marketing Board was created. Under the Board's rigid system of quotas to equate supply and demand, the modern acreage has risen slowly to a modest 20,000 today.

The location of hop areas for relevant periods is depicted in Figures 1 and 2. The significant features are the general rise in acreage to 1878 followed by a rapid decline, with a current figure comparable with that existing in 1700; the former more widespread distribution of the crop; the dominance of two main areas throughout—south-east England and the west Midlands; the wider fluctuations of the Kent–Sussex area compared with the more stable Hereford and Worcestershire district; and the disappearance of the famous Farnham area.

Acreage fluctuation since the mid-nineteenth century

The rise to a peak acreage in the later nineteenth century resulted from increased demand, removal of the hop excise duty, a variable yield, and the remunerative element associated with hop-growing. The

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* For example, an Excise Return for 1655, the Lansdowne MS. 1215 in the British Museum, omits entirely Herefordshire and Worcestershire.

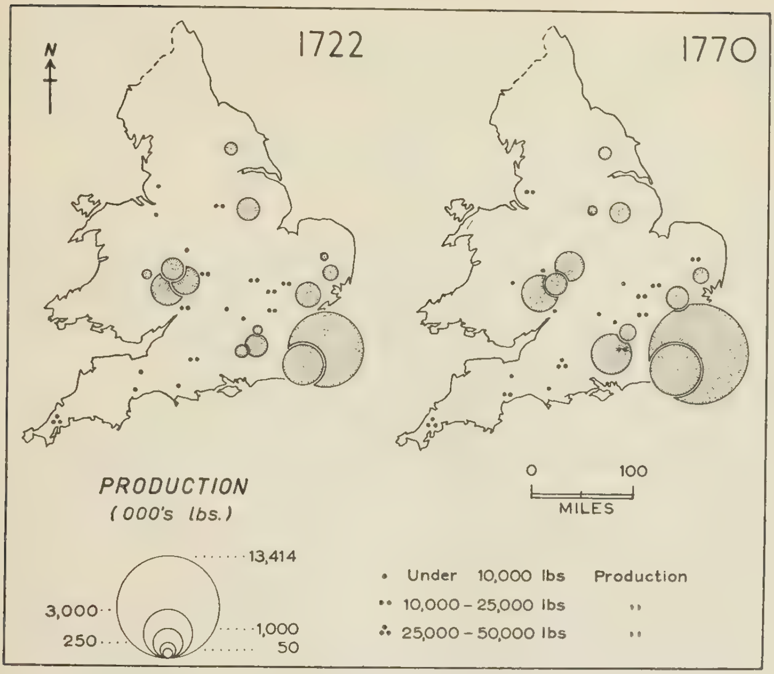

Fig. 1.—English hop production in the eighteenth century. Production is recorded by excise areas, so that the apparent change in the relative importance of the three counties in the West Midlands and between Hampshire and Surrey may be misleading: circles represent the collection districts for the hop duty, and not specific county totals. Sources: For 1722: *Treasury Papers*, 1729, vol. cclxxi (T./1/271). For 1770: *Annual Register*, 1770, p. 177.

hop-plant, prone to attack by numerous pests and diseases, fluctuated in yield (see Table I) more widely than any other crop. Large areas of hopland were therefore maintained as an insurance against poor harvests, and also in the hope that a locally successful crop would coincide with a year of widespread failure. Thus Cadle[1] in Worcestershire and Young[2] in Sussex called hop cultivation "the gambling of farmers"; in Kent Buckland[3] termed it "a lottery". The abolition in 1862 of a heavy excise duty on hops, averaging about £7 per year on each acre, gave further impetus to the attraction of hop-growing, particularly in those areas where the excise duty had made their cultivation economically precarious.

Table I

Year	1853	1854	1855	1898	1899	1900	1901
Acreage	49,367	53,825	57,757	49,735	51,843	51,308	51,127
Production (cwt.)	283,920	88,188	743,047	357,000	661,000	347,800	649,300

One of the reasons for the big decline in hop acreage (Fig. 3) is that the post-1862 increase was largely unwarranted and indiscriminate, the crop often being taken up by farmers with insufficient capital growing coarse varieties. This applies especially to the Kent and Sussex Wealden area. Other reasons are the improvement in reliability of the harvest and in yield per acre. From a consideration of the average yields for the years 1807–15, for the peak acreage period, and for the most recent years it will be seen that in the production terms of the 1878

Period	1807–15	1875–86	1945–56
Average total acreage	39,100	68,800	21,500
Average yield per acre	5·8 cwt	6·88 cwt.	13·15 cwt.

era the present acreage is worth at least 40,000 acres. A further point is that the 1862 Act abolishing the hop excise duty removed also the import duty, thereby permitting competition from foreign hops. Before 1850 English hops had satisfied the brewers' requirements, but after the turn of the half-century and with the 1862 Act as a stimulus brewers began to demand an admixture of foreign hops to effect—mistakenly or otherwise—a better product. By 1870 a third of brewers' requirements was being imported, while England's seeded hops, unpopular on the Continent, were not exported. A slight decline in beer consumption and brewing of beers of lower strength are additional reasons. Consumption of "the best long drink in the world" has dropped from around 30 million barrels in the 1880's to 26 million today. Before 1870 as much as 6 lbs. of hops per standard barrel were used in the brewing of certain heavy class beers; by 1890 the general hopping rate had decreased by at least 1 lb. per standard barrel; today the rate is around 1–1½ lbs. This trend, dictated initially by the human palate, has been encouraged by brewers in order to prevent their product becoming prohibitively dear under crippling government taxation.

Minor centres of hop production

The geographical distribution of hops was once far wider than at present (see Figs. 1 and 2). The greatest dispersal occurred well *before* the era of England's peak acreage of the late nineteenth century—that is, before the advent of the earliest forms of modern communication (turnpike roads and canals), and before the concentration towards the end of the eighteenth century of the brewing industry in large cities. Almost every county in England and Wales has at some time grown hops. But these minor districts—of which Nottinghamshire, Suffolk, and Essex were the largest—have never been important either individually or collectively, and they constituted under 300 of the 71,000 acres in 1878. These small areas suffered from isolation from the main stream of ideas, often had difficulty in finding skilled labour for this specialized industry, and grew hops of coarse variety, the market for which contracted in the second half of the nineteenth century. These centres, often begun fortuitously by an individual farmer's initiative, were equally liable to disappear by local accident.[4] The 1862 Act therefore gave no stimulus in scattered areas, which for many years previously had been exposed to the general economic forces that were to lead to today's pattern of areal concentration.

Main centres of hop production

Throughout the history of hop-growing in England the west Midlands and four south-eastern counties have been dominant. Kent and Sussex have always possessed well over half of the national acreage, and their fluctuations of production have acted as a kind of barometer of hop prosperity for the whole country. The 1878 peak and subsequent decline were largely the symptoms of changes in acreage in Kent and Sussex (see Fig. 4). As a result of the 1862 repeal of the hop duty, and with the help of improved drainage conditions, the low Weald of Kent and east Sussex became dotted with small hop gardens growing

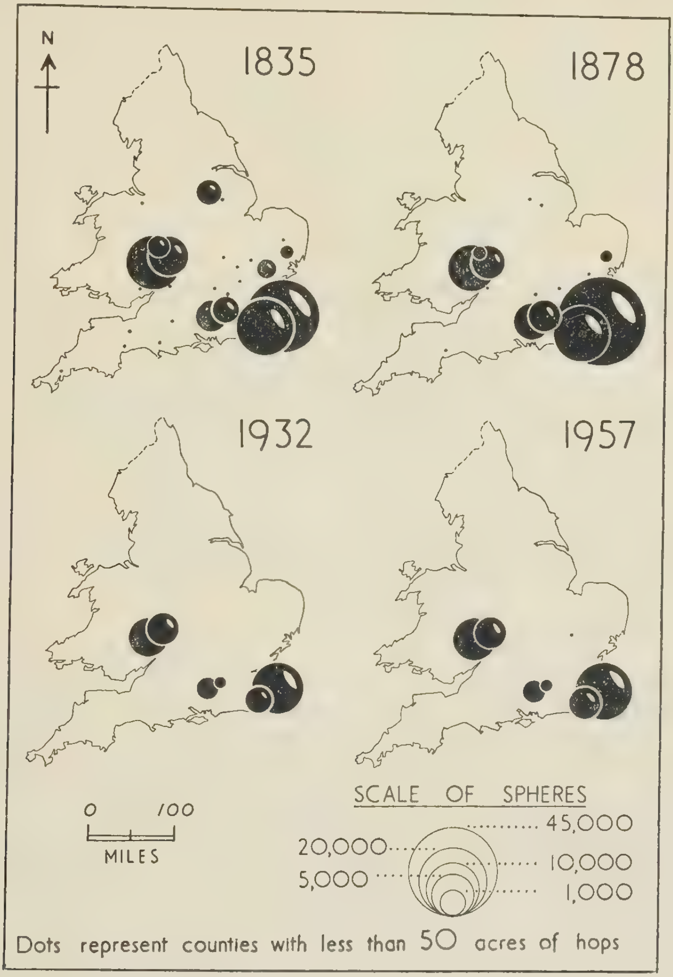

Fig. 2.—English hop acreage in the nineteenth and twentieth centuries. The 1835 distribution is representative of the pattern before the sharp rise in acreage in the second half of the nineteenth century, 1878 is the peak acreage year, 1932 is the year of greatest contraction, and 1957 shows the present distribution. Sources: For 1835: *Parliamentary Papers*, 1839, lxvi, pp. 519–69. For other years: statistics supplied by the Ministry of Agriculture, Fisheries and Food.

coarse varieties.* Most of these were quickly dismantled when it was realized that brewers were demanding better variety hops, and of those remaining many become uneconomically small under the compulsory halving of holdings between 1914–18.[5] The west Midland's stability reflects that region's earlier adoption of quality hops, and greater attention to the cultivation and drying. The west Midlands also produced their hops more cheaply because of lower land values and earlier use of horse-teams, a factor recorded by Whitehead[6] in 1882, and Parker[7] in the period prior to the first world war. As a result, the 1915 hop-acreage of Herefordshire and Worcestershire reveals a reduction of less than 2 per cent from the 1878 figure, while Kent and Sussex underwent a 58 per cent reduction in acreage.

Figures 1 and 2 also indicate the decline of the Farnham area on the borders of Surrey and Hampshire. Now unimportant, Farnham hops were once the most famous in England, the result of favourable physical conditions and the local conscious effort in growing, sorting, and picking in order to maintain the highest standard. However, these standards lapsed and the area began to rely on its "name", while its market in the Midlands was lost to the cheaper production of Hereford and Worcester, and to imported foreign hops. Farnham parish in 1878 boasted some 1500 acres of hops and four breweries; today the breweries are silent and only 45 acres of hops remain.

Discussion of present distribution

It is impossible to "explain" or "account for" the distribution of hop growing in simple terms. Among the physical requirements at least 12 inches of rain are needed during the short period of rapid vegetative growth from April to September, with a daily mean temperature of around 60° Fahrenheit between June and August. Taking into consideration the climatic requirements and the need to shelter the delicate plant from strong winds, a rough line can be drawn from the Humber to the Mersey to the Exe enclosing a zone suitable for hop-growing. Within this zone the hop could find an appropriate soil in deep, good-working loams if the subsoil possessed adequate moisture, but the plant's distribution has always remained relatively localized. Distribution of groundwater suitable for the brewing process, or location of the breweries themselves, holds no magic key for this formula.

Nevertheless, it can be said that the area of hop-growing in the south-east contains very favourable soils on the North Kent brickearths, on the Lower Greensand around Maidstone, and even in the Weald on alluvial loams and gravels; and in Herefordshire and Worcestershire there are first-class soils.

When hops were first introduced—and grown on a small, even domestic, scale—the crop could not be grown successfully in an area

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* Even today almost half the holdings are under 10 acres compared with the national average of 23 acres.

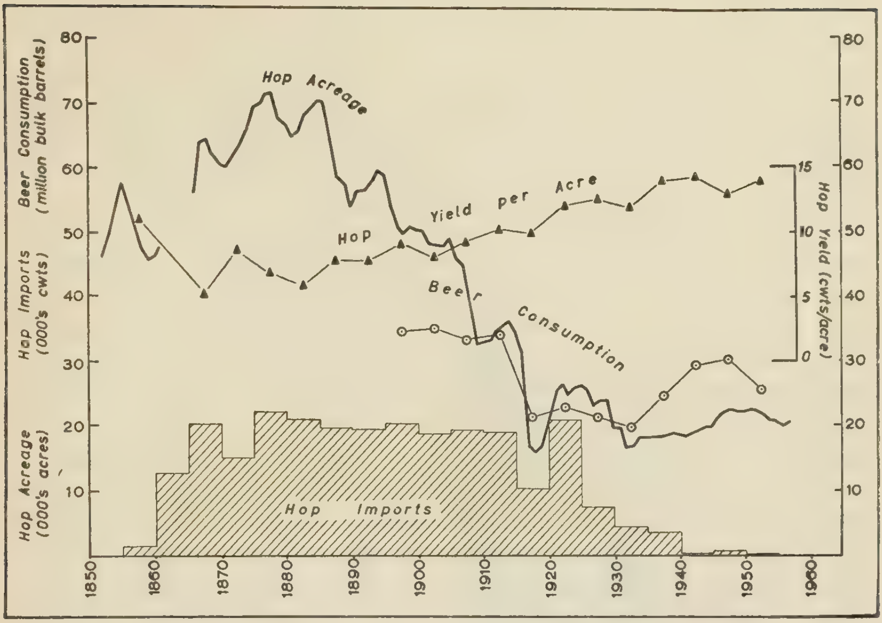

Fig. 3.—Some causes of a declining hop acreage. Statistics supplied by the Ministry of Agriculture, Fisheries and Food, and from *Annual Abstract of Statistics.*

of open-field agriculture. Significantly, both the southeast and Herefordshire and western Worcestershire were areas of early enclosure. It may be supposed that once hop cultivation had developed from a small-scale activity the labour supply would be inadequate and much seasonal labour would be required. Significantly again, at an early date Herefordshire, Worcestershire and Kent were already leading areas of fruit-growing, a form of agriculture which needed a large seasonal influx of harvesters. Both hop areas were near two large—and early developed—industrial areas and annual migrations were possible between London and southeastern England, and between the Black Country and the west Midlands. The two industrial areas were also important in that they provided large, accessible markets; and supplied hop-gardens with the huge quantities of manure which they needed. The southeast also possesses the added advantage of close proximity to Flanders and the Continent, and has thus benefited from any outside stimulus.

Changing conditions of hop-growing

When considering the future outlook there seems no reason why hops—from a physical point of view—should not have a wider distribution. It has been shown that in the past hops *have* been grown more widely, appearing in areas ranging from Cumberland and Durham to Wales and Cornwall. Vestiges of former activity can still be recognized in "wild" hops growing profusely in hedgerows in several parts of east and midland England, or in disused and converted oasts. It is interesting to note that hops have recently been successfully grown on a research farm near Cambridge.

Any future extension of acreage, however, is likely to be limited by several non-physical considerations. Assuming a grower can obtain a quota he must still find much hand-labour for training, pruning, cutting —if not picking—as well as a large initial capital for outlay on an oasthouse, wirework, pickers' accommodation, or, even more expensive, a machine-picker. If expansion outside the present regions is unlikely, *within* the producing centres acreage will be controlled by brewers' demands and the advent of machine-picking, both operating within the rigid quota framework of the Hops Marketing Board. A modern trend which may be expected to continue is that of increasing industrialization of hop-growing: as small growers go out of business their quotas are bought by larger concerns. The average holding, under 15 acres in 1930, is today 23 acres; the number of growers, over 6000 strong in 1878, has dropped from almost 1500 in 1930 to 963. Another increasingly important factor is the entry of the large brewers into the field of hop-cultivation. Brewers are permitted to grow hops independently of the Hops Marketing Board, and, although possessing today only about 1500 acres of England's total hop-acreage, since 1932 their holdings have accounted for *one quarter* of the national acreage increase.

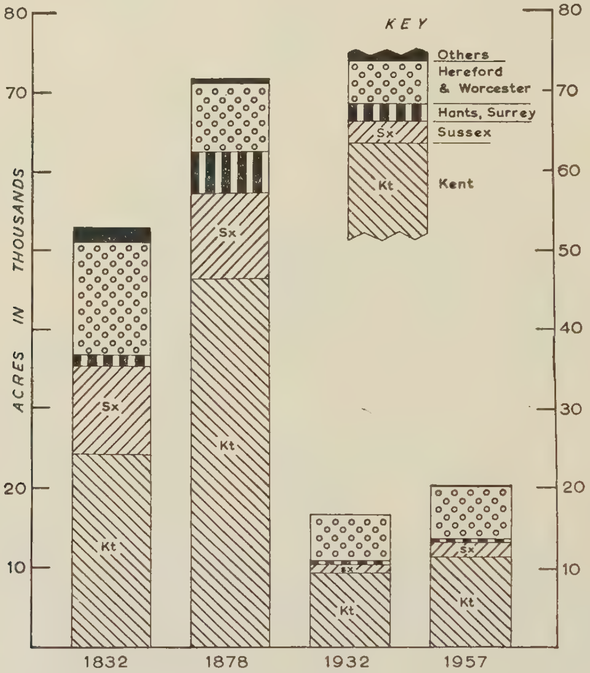

Fig. 4.—Comparative hop acreages for selected years. Columns represent county totals for the four years shown in Figure 2. Same sources as in Figure 2.

Brewers have given a lead in machine-picking of hops, another aspect of considerable importance.

The mechanization of hop-picking has developed slowly because of mechanical imperfections of machine-pickers and the short period available each year for experiments. Machines are also too costly for the average farmer's pocket. But the picture is now rapidly changing as a result of the increasing difficulty in obtaining hand-pickers. More efficient and smaller machines are being developed against the continued rise in overhead costs and the proportionally cheaper operational costs of machines.

In 1949 machines were used widely in the west Midlands, and in 1952 the first was erected in the southeast. By 1955 a third of England's hops, including over half of the west Midland's, was machine-picked; by 1957 about one half of the total crop was gathered in this way.

Changes in the hop-growing industry are accompanied by changes in plant breeding and growing. In order to produce a hop-plant most suitable for machine-picking, there must be wider-spaced and fewer bines per hill than at present; and seedless cones, which "pick" better than the present seeded hops, are smaller. Both these considerations, if applied, would lower the yield per acre. Already, "it is probable that the grower loses up to 25 per cent of his crop annually through machine-picking"[8] as a result of unripe harvesting (hops "pick" better when unripe), wastage through shattering in transport or in the machine, and final sorting to produce a physically attractive sample.

Despite future trends in plant breeding and increase in yields to even higher standards as the lower-yielding areas improve, and despite further machine improvements it would seem that at least a temporary increase in acreage is inevitable. Already, with the unfavourable weather and mediocre crops of the last two summers, quotas were unrestricted for 1957. However, until the Englishman's love of beer can equal the Frenchman's liking for wine, it is certain that this increase will not be spectacular. England's golden era of hop-growing has passed, and the remaining acres of this distinctive crop are experiencing that giant of the twentieth century more often encountered in other fields—automation.

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Madrid: The Circumstances of its Growth

P. P. COURTENAY

"Castilla la bien nombrada"—*el Cid*, canto XXXV

THE SPANISH KINGDOM OF CASTILE, the heart and core around which developed the unified nation of Spain, occupies the greater part of the central massif or Meseta of Iberia. Its two divisions, physically well-defined—Old Castile or the upper Douro basin, the first to be recaptured from Moorish control, and New Castile or the upper Tagus and Guadiana basins—are aptly named. Ranges of mountains surround the kingdom on all sides except the western, and acted as ramparts which in pre-Christian times long protected Celtic and Iberic tribes from the legions of Rome, and later served as bulwarks from behind which the rest of the peninsula was dominated. Reconquered in the eleventh century A.D., the southern basin (New Castile) became the centre of regal power and it is this region which today is the more significant. This fact, however, presents an interesting problem. Physical conditions alone considered, New Castile is very poorly endowed to be the heart of a European nation. It is remote and, until the modern air age, was difficult of access. The ramparts which kept at bay the Roman legions have provided similar barriers to trade and commerce. To the north of the basin rise the 2000-metre igneous peaks of the Sierra de Guadarrama; to the east the equally high Palaeozoic cores of the Serranía de Cuenca; to the south the harsh Palaeozoics of the Sierra Morena—a rugged escarpment overlooking the Tertiary valley trough of Andalucia. On the west, where the well-developed valley of the Tagus opens Castile to Lisbon and the Atlantic, the physical milieu seems more promising, but the presence of deep gorges and cañons in Estremadura prevented the Tagus valley from ever being an effective line of communication. Even today no road or railway follows the valley route from Castile to Lisbon.

Soil and climatic conditions within the basin are inclement. The Tertiary and Pleistocene deposits derived from the surrounding uplands are often coarse and, except in the river flood plains, infertile. Rainfall is scanty—the twenty-inch isohyet approximately bisects the basin—and temperatures are extreme, a consequence of both altitude and continentality. In four of the five provinces into which New Castile is divided for administrative purposes, the unfavourable

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environment is unmistakably reflected in the population densities. Modern Spain is divided into fifty provinces. If the average population density (1950)[1] is calculated for each province and the provinces then arranged in descending order of density, it is found that Toledo is 36th, Ciudad Real 42nd, Cuenca 47th and Guadalajara 48th in the list. A major contrast however is apparent in the case of Madrid. The province of Madrid is the third most densely populated in all Spain (exceeded only by Vizcaya and Barcelona), and the city itself, with over one and a half million inhabitants, is the largest in the country.

Madrid, dominant over Castile, is also indisputably the centre of the whole of modern Spain. It has a number of growing metropolitan industries, and is the seat of centralized government, re-established after brief appearances of local autonomies under the ill-fated republics. It is the focus of all communications—in no way is the dominance of the city over the rest of Spain more apparent than in its influence upon the pattern of the country's major roads and railways. Simplified, Spain's principal lines of communication correspond very much to the shape of a cartwheel, with Madrid at the hub and the great regional cities (Bilbao, Barcelona, Valencia, Seville, etc.) located at the junction of spokes and rim. It is clear that this pattern of communications, developed largely to serve Madrid, has done much also to extend the capital's influence direct to the peripheral regions and at the same time to isolate to some extent many of these regions from one another—to travel from Barcelona to Seville, for example, it is necessary to go via Madrid or by a long tedious route around the coast.

Because of the economic poverty of its environment, Madrid is very dependent upon its road and rail links with the coast for the provision of many of its daily requirements. There are, for example, daily deliveries of fish to the capital's markets from Vigo, Pontevedra, Avilés and Gijón in the northwest (at an average distance by rail of over 800 kilometres) and from Málaga, Cadiz, Huelva and other ports in the south.[2] Fruit, vegetables and flowers are supplied regularly from the Maresme, the market gardening region northeast of Barcelona[3]—a journey of over 600 kilometres. The importance of Madrid as a market for these contributing areas means that the capital has a powerful economic influence over them, especially in the case of the fishing ports. Not only is the city their major customer but, because of its position with regard to communications, it acts also as a redistribution centre.

Madrid is culturally dominant—its language is the accepted official tongue, the city is the centre of art (the Prado being rated second only to the Louvre among the galleries of the world), of the theatre, of education (the University moved to Madrid in 1836 from nearby Alcalá de Henares where it had been founded in 1509), and of fashionable society. Money is earned in the iron works of Vizcaya and Asturias and in the commercial offices and factories of Barcelona, but political and economic control emanates from Madrid. Nevertheless Madrid remains an anomaly in Castile. Whether the city is approached by rail or road across the barren drabness of the Castilian landscape—a dusty plain intersected by seasonal watercourses and scattered with granite boulders from the Guadarrama—the appearance of Madrid is sudden. It has no rambling industrial or residential suburbs, there is no gradual increase in urbanization as the centre is approached. In few, if any, other major European capitals can the line between city and countryside be more clearly drawn. Madrid is a cosmopolitan twentieth-century city situated in the midst of a region that has changed little since the Reconquest.

The local site

A detailed study of the local site of Madrid throws little light upon the basic question of why such a powerful capital should have developed in such an unlikely environment. The city is situated mainly on the left bank of the river Manzanares, a tributary of the Jarana, a stream which joins the Tagus at Aranjuez (see Fig. 1). At Madrid, the Manzanares is flowing at 625 metres across an expanse of Pliocene sands and gravels. It receives a number of short streams from the right bank and a few very minor tributaries from the left, one of which probably located the nucleus of Visigothic Madrid. The interfluve between the Manzanares and the Jarana consists of a flat-topped spur reaching 700 metres, and it is on the gentle western slope of this spur that the city has grown (see Fig. 2). There has been only very limited development on the right bank of the Manzanares—possibly owing to the more dissected nature of the terrain caused by the small tributaries, and to the existence of parks lying behind the Palacio Real. Roads and railways approach Madrid with ease across the surrounding country, their alignments being determined by the routes out of Castile through gaps in the mountain rim rather than by any peculiarity of the city's position. It can fairly be concluded that although the site does not seem to be sufficiently striking to have attracted a major settlement without some strong external stimulus, at least it had sufficient advantages, or lack of disadvantages, to permit such a settlement to develop once it had been initiated. It is also apparent that the growth and present importance of Madrid cannot be explained by economic factors. On economic grounds alone, other cities, notably Barcelona and Valencia, have overwhelmingly stronger claims to capital status. The dominance of Madrid depends on other circumstances, for the elucidation of which an historical approach to the problem is most appropriate.

Early developments

There is some scanty evidence that the site of Madrid was utilized in prehistoric times. During the Celtic and Iberic eras (the sixth to

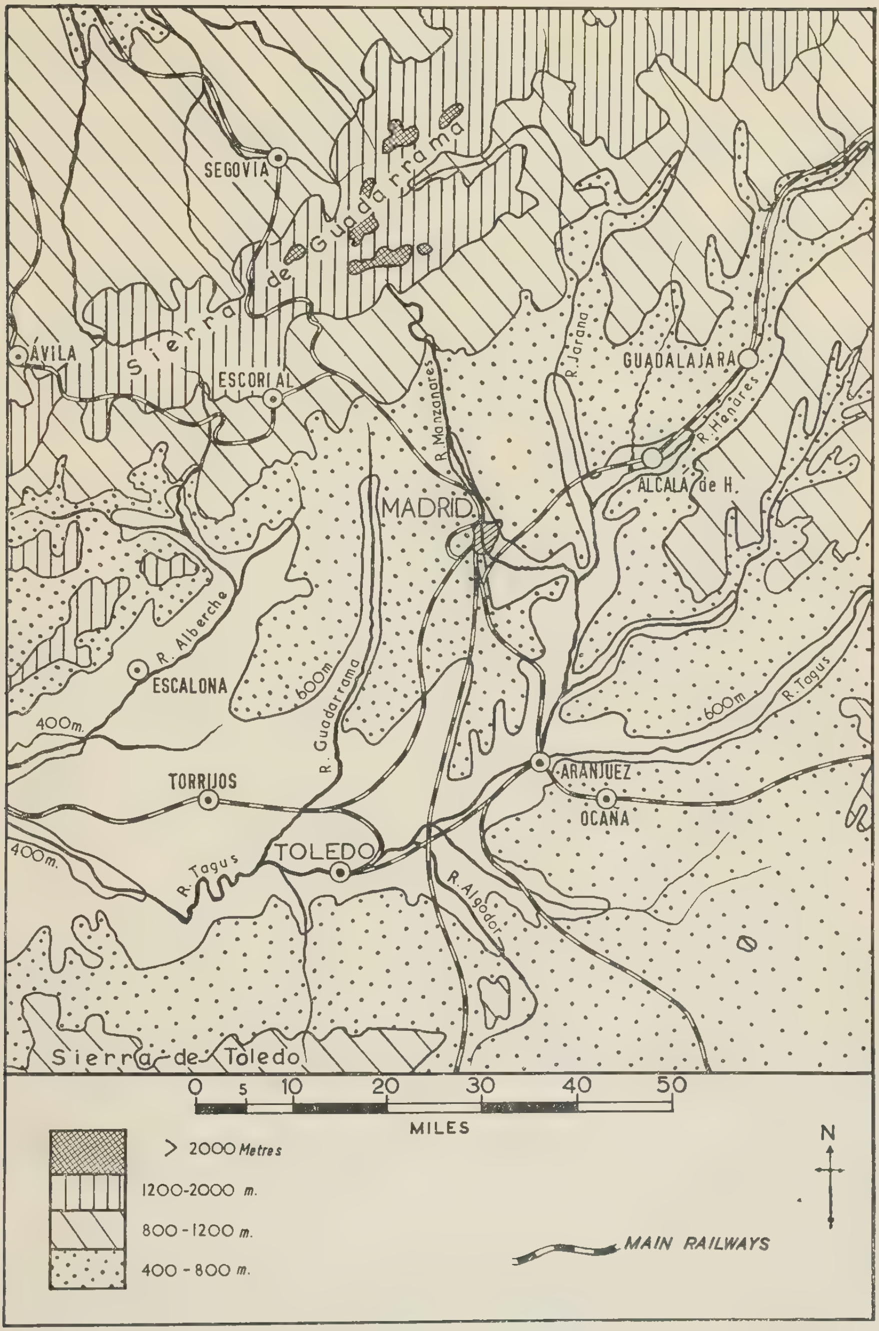

Fig. 1.—The upper Tagus basin.

third centuries B.C.) the site was unimportant, the Celt–Iberian capital being at Numantia in Old Castile. It is believed that there was a Roman settlement at Madrid but the present town probably originated as a Visigothic centre in a small tributary valley of the Manzanares (now located by the line of the Calle de Segovia—see Fig. 3). Under the Moors it was a fortified outpost, clustering around the Moorish *alcázar* or castle built on what is now the site of the Palacio Real in the west of the city. The Moors were responsible for the town's first organized water supply—carried from the Guadarrama by 72 kilometres of undergound galleries (which still supplied Madrid with water in the early nineteenth century). The relatively minor importance of the site throughout these periods suggests that it possessed no inherent physical characteristics which suited it to be a centre of significance. In fact, under Romans, Visigoths and Moors, the centre of the administration of Castile was Toledo, a town in a superb defensive site on a meander core of the rejuvenated Tagus. Madrid was reconquered for the Christians in 1083 by Alfonso VI, who, however, continued southwards to take Toledo which he made his capital and defensive centre.

The first glimmer of the importance which was later to come to Madrid appeared in 1329, when the first Cortes of Castile was held there. The shift of political direction from Toledo, it seems probable, was due to the greater security resulting from further defeats of the Moors and their retreat southwards, which rendered obsolete the defensive function of Toledo. Madrid was in an advantageous central position with regard to both Old and New Castile, was conveniently placed in relation to routes across the Guadarrama by the Henares and Jarana valleys, and its position away from the royal and military centre at Toledo may also have been selected to give these first representatives of the people less feeling of being too much influenced by the presence of the traditional rulers—the king and the army.

The following century and a half of Spanish history was dominated by the gradual reconquest of the rest of the peninsula, a crusade which culminated in 1492 in the final overthrow of the Moors and the liberation of Granada by Ferdinand and Isabel. Throughout this period Madrid's importance grew little, the energies of the Castilian kings were all thrown into the wars against the infidels rather than into political and urban development, and when the town was visited in 1524 by the Emperor Charles V (grandson of Ferdinand and Isabel), for the sake of his health, its population was only about 3000.

The choice of a capital

The choice of Madrid as a convalescent centre by the Emperor of half Europe had a sudden and profound effect upon its popularity and development as a fashionable town. By 1560, it is estimated, the population of Madrid was approaching 30,000 and by 1600 it was 40,000. This increase is all the more remarkable when it is noted that there was a huge decrease in the population of Spain as a whole between 1500 and 1550 owing to emigration to the New World. In some areas the decrease was as much as 50 per cent, and it was not until 1591 that the total population returned to the level of 1491, the year before the discovery of the Americas.[4] The Emperor Charles V is believed to have planned to move his capital from Toledo to Madrid but during his frequent absences from Spain he did not do so. His son, Philip II, during his regency of 1543 to 1556 established his capital at his birthplace, Valladolid, with a temporary move between 1551 and 1553 to Madrid. In 1561, King of Spain in his own right, he finally moved his seat of government to Madrid, making that city the capital of a united Spain whose power and glory were at or near their zenith.

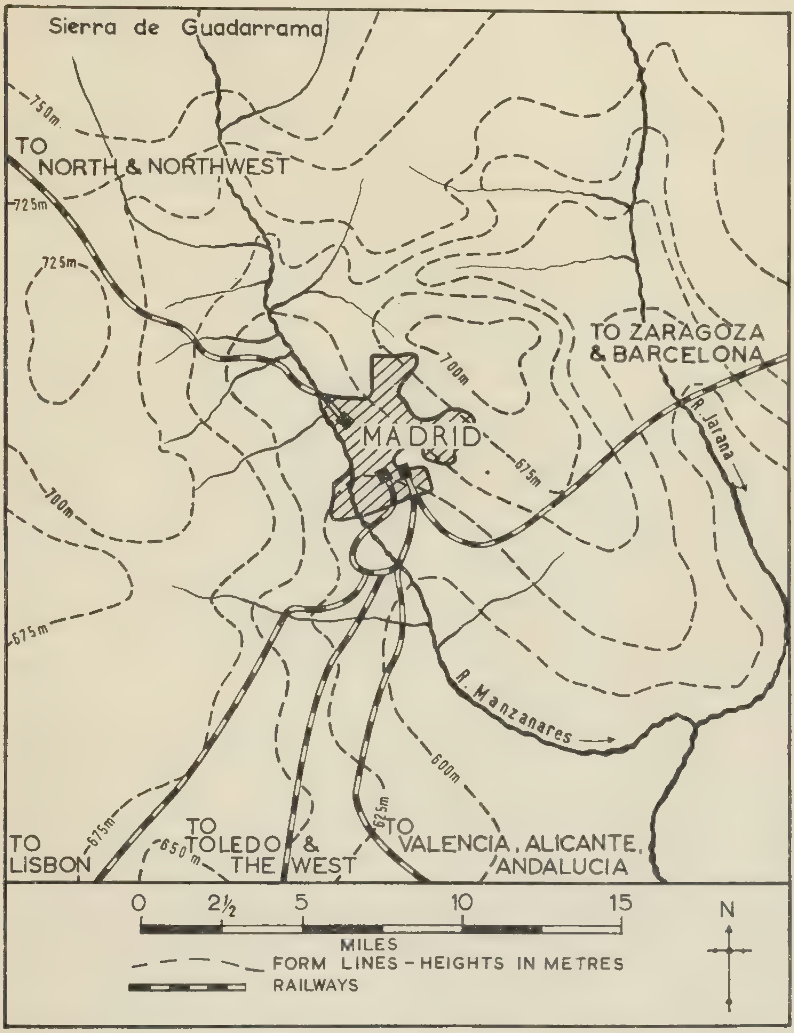

Fig. 2.—The site of Madrid.

The reasons for Philip's choice are worthy of some consideration since few authorities seem to agree and often rather facile arguments are advanced. The problem seems to divide itself into two parts; first, why was a capital chosen in Castile at all when many far richer and more vigorous cities existed elsewhere in the peninsula, and secondly, why, when Castile had been decided on, was Madrid chosen in preference to the historic Castilian capital of Toledo?

W. H. Prescott, the nineteenth-century historian, claims that Philip was merely carrying out the ideas of his father, the Emperor, for whom the chief recommendation of Madrid seems to have been the climate.[5] The brisk and rarefied atmosphere was a deterrent to the fevers and ague which frequently attacked him, and he spent much time there. It seems strange, however, for Prescott to believe that Philip II should have moved his capital to a site that was benevolent to his father's health for that reason alone, especially as he goes on to decry Madrid's position as possessing "manifold evils" (he quotes Ford's *Handbook of Spain* in support). On page 191 of his *History of the Reign of Philip II* Prescott lists the "evils" of Madrid: the keen winds from the mountains, the isolated nature of the situation—cut off from the provinces by "a dreary expanse of desert"—and the insufficiency for commercial purposes of the Manzanares. These would appear to be perfectly sound reasons for not putting the capital at Madrid, and since one can hardly agree that his dead father's health could have influenced Philip's choice, there remains only the powerful factor that Prescott considers a "fanciful advantage" —the centrality of Madrid.

To choose a capital in a region that has as its prime, and perhaps only, advantage the fact that it is geometrically the centre of a country would in most cases be unwise. More substantial qualifications would normally be required. In Spain however the markedly regional nature of the country, its natural disunity, is a very potent and ever-present factor. Regional jealousies are very strong; the Spaniard is very individualistic and his normal sentiment is to feel himself a Castilian, a Catalan or a Basque before feeling himself to be a Spaniard. Castile without doubt dominates the peninsula. From its lofty plateau position it looks proudly down on the fringing coastal regions, strongly separatist but any one of them easily mastered militarily by a centrally controlled army. Castile also had the immense prestige of having recently been the main contributor to the defeat of the Moors. In a geographical sense, a capital in Castile would literally 'supervise' all the regions of Iberia in a way in which no city in any other region could possibly do. J. M. Houston states clearly that Madrid was selected to dominate other cities such as Barcelona, Valencia and Seville, but especially to check the challenge of Catalonia.[6] Its focal position within the peninsula was an undoubted advantage to the government of Philip II, which was highly centralized. It can fairly be concluded that the selection of any one major peripheral city of Iberia as the national capital would have produced great difficulties of administration and set up tremendous tensions amongst the distinctive and rival regions of the peninsula, which would almost certainly have resulted in the disruption of the so-recently achieved unity of Iberia. A capital in New Castile in the geometric centre of Spain was the only possibility if unity was to be maintained.

This fact alone, however, does not unequivocally indicate Madrid. Toledo, the historic Castilian capital, also occupies a central position in Iberia (it is, in fact, only 45 miles southwest of Madrid) and might well have been considered. It is possible that it was thought wise to choose a city that stressed less the dominance of Castile than would Toledo, to avoid partly the inevitable jealousies of the great peripheral cities. Moreover the question of water supply may have influenced the rejection of Toledo and the selection of Madrid as capital.[7] Toledo procured its water direct from the Tagus, at this period by means of a series of waterwheels which raised the water from the river to the hilltop town. The Tagus water was far from pure and compared badly with both the local Madrid water, which is filtered naturally by the Tertiary sands on which the town is built, and with the water carried from the Guadarrama by the Moorish galleries. It seems extremely likely that such a question of water supply would have influenced the establishment of the capital at Madrid.

An important point which seems to have been overlooked by historians is the inadequacy of the site of Toledo for the capital of Europe's largest and most powerful empire. Toledo's meander core was a superb situation for a walled medieval city but hopelessly inadequate for an imperial capital. The centre of a power rich with the gold of the New World, and the standard-bearer of Christianity, required a grandeur and spaciousness that Toledo could not offer. The town was, and still is, cramped within walls on its steeply sloping hilltop site. Its streets were narrow, its buildings making use of all available space. It had no room for amenities such as parks or impressive public buildings. Across the Tagus the hills were barren and gashed with deep gullies, still practically uncultivated and unbuilt on at the present day. A contemporary chronicler, Cabrera de Cordoba, says that Philip II (and, presumably, also Charles V who first planned the move) considered Toledo *incapaz*,[8] i.e. incapable, of remaining the capital. This can be read as meaning that the site was unsuitable in a morphological sense rather than being unsuitable from other, such as political, points of view, and indeed such an interpretation would seem the most logical.

Growth before 1800

The growth of Madrid in the sixteenth century was accompanied by increasing poverty in rural Castile. The great forests of oak and pine which surrounded Madrid, and which have been cited as contributing to its healthfulness, were cut to help defray Philip II's court expenses—for he was never out of debt, having inherited great liabilities incurred by Charles V in his many wars. The forests were never replaced, owing primarily to the difficulties of regeneration in an area of scanty rainfall. The economic policy of the rulers was concentrated on industrial progress whilst agriculture was neglected. Thus the absurd position was reached that whilst Spain as a whole (though not the King!), as a result of the phenomenal amount of gold flowing from the New World, was the richest country in Europe, the price of wheat in Castile under the conditions of agricultural neglect and poor harvests which followed the expulsion of the Moriscos, was exorbitant and beyond the purchasing power of all but the rich. Castile was in the throes of a massive inflation.

During the later sixteenth and the seventeenth centuries there was a general decline in industry and agriculture and a decrease in population in both Castile and Madrid. This was probably due to the fact that industry and agriculture were less actively encouraged under Philip II's successors and that the inherent physical disadvantages of the region—poor soils, low rainfall and extremes of temperature—were able to reassert themselves.

The great revival which was the beginning of the process which really secured Madrid and Castile as the core of modern Spain began in 1700 with the death of the last of the Hapsburgs, the feeble-minded Charles II, and the establishment of the Bourbon dynasty under Philip V. The Bourbons were absolutist monarchs. They destroyed what local autonomies had existed in the peripheral regions of the country, and reinforced the dominance of Castile and Madrid. Immigration into Castile was encouraged and industries established or rejuvenated —metal work, pottery, cloth and leather became of importance in Madrid, Avila and Talavera.[9] Public works were instituted, agriculture improved by internal colonization on the fringes of Castile in Andalucia, Murcia, Estremadura, Alicante and the Sierra Morena, and fruit and horticulture were developed on crown lands at La Granja and Aranjuez. Much of Madrid was rebuilt in granite and limestone—palaces, gates, bridges and churches were constructed in order to make it a worthy European capital. Some of the best architecture in the city dates from the early Bourbon period.

The nineteenth and twentieth centuries

The nineteenth and twentieth centuries have seen Madrid assume the undisputed role of capital of all Spain—the separatist movements in Catalonia and the Basque provinces have merely sought local autonomy, it has never been seriously suggested that Barcelona or Bilbao should replace Madrid as the national capital.

By about 1830, the city had reached a population figure of 201,000

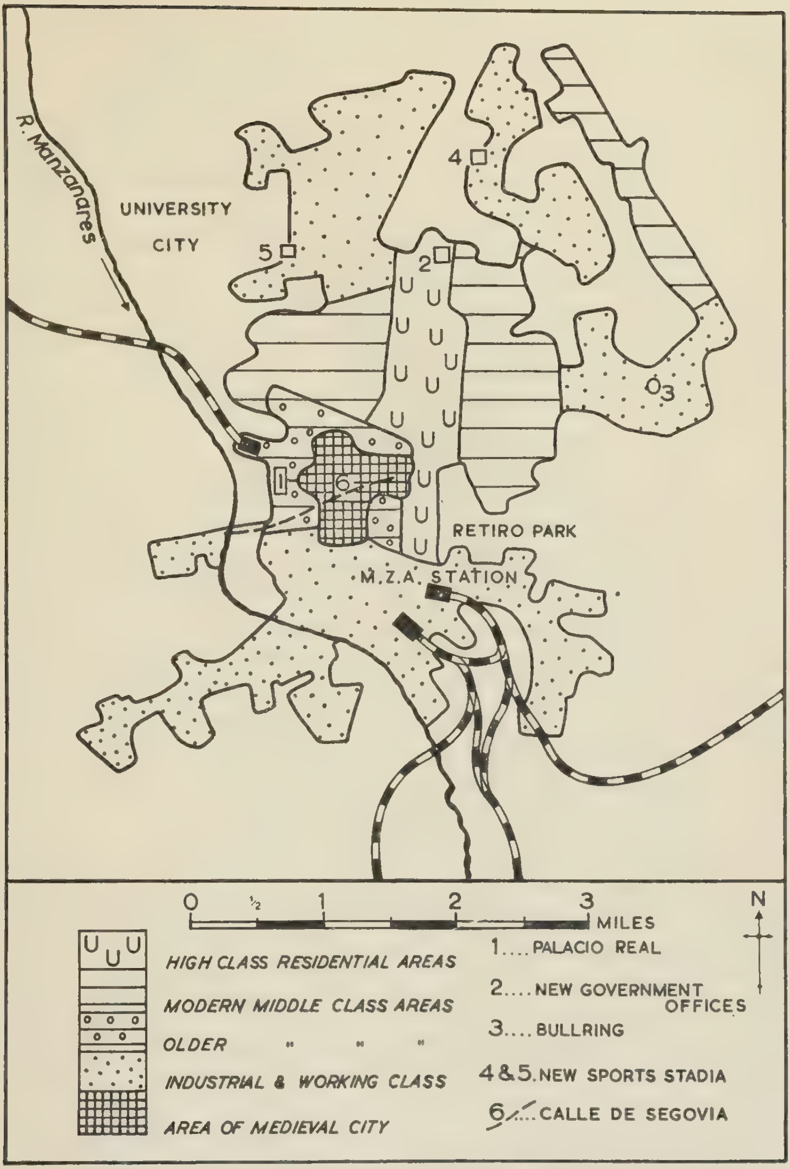

Fig. 3.—Simplified urban morphology of Madrid. Partly after A. Lopez Gomez.

and was finding its existing water supply inadequate. At this period therefore, simultaneous with other public works such as the building of the Opera and the Madrid–Aranjuez railway, was constructed the Canal de Isabel II which carried water from streams and reservoirs in the Sierra de Guadarrama for the use of the city. The third quarter of the nineteenth century was a period of considerable political turmoil in Spain, but Madrid continued to grow in size and economic importance, until by the turn of the century its population had well exceeded half a million (Houston says 512,000 in 1900, Melón 539,835)[10]. This development was accelerated greatly during the twentieth century to reach the figure of 1,618,435 by 1950. Although there was a tremendous increase in population throughout Spain in this period (the national total is now almost twice what it was in 1857) Madrid has in recent years been growing more rapidly than the national average. In 1920, for example, Madrid contained 3·95 per cent of the Spanish population, but by 1950 it had 5·78 per cent.[11] Although the general increase in urban populations has been felt throughout Spain, natural growth has been greater in the rural areas. The attraction of rural population to the industries and higher standards of living of the cities (especially Madrid and Barcelona) and the gradual annexation of neighbouring villages and small towns by these cities have been primarily responsible for the rapid urban development. For example, between 1941 and 1950, Madrid absorbed no fewer than eleven previously independent municipalities into its metropolitan area.[12]

Madrid has been able to support this great increase in its population by the development of a variety of industries which have in turn attracted more people to the capital. As is to be expected, an almost complete lack of raw materials has prevented the growth of any heavy industry, but otherwise manufacturing industry is varied, and concentrates mainly upon consumers' goods—leather, furniture, glass, carpets, light engineering and food products. Power is primarily either hydro-electric supplied from the Guadarrama streams or thermal-electric using coal from the small carboniferous basin at Puertollano which has good rail connexions with Madrid.[13] The majority of the industries are located towards the outer bounds of the city within close proximity of the two railway stations—a natural consequence of the fact that most raw materials have to be brought to Madrid from elsewhere (see Fig. 3). The prime concentration of factories and workshops is around the M.Z.A. Station in the southeast of Madrid. This is the main terminus of the railway from Barcelona, Spain's principal raw material market.

Just as political influences have been supreme in accounting for the choice of Madrid as Spain's administrative centre, so they can be cited as having a great effect on its economic development. Although their influence is obviously absolute in an indirect way (had Madrid not been chosen as the capital it probably would have remained very much a minor town economically), political decisions have also been of more direct consequence to industry. There have been, for example, in recent years special economic concessions favouring the extension of industry on the Meseta.[14] Permits for the importing of machinery from overseas are more easily obtained for industrial development on the Meseta than for similar development elsewhere. This policy is described as an attempt to improve the economy of a region that is basically a poor agricultural one, but it also appears as an attempt to challenge the economic supremacy and resulting separatist aspirations of Catalonia. The existence of the main governmental organizations in Madrid, as well as its position as the country's major distribution centre, have also aided its industrial growth. At the present time Madrid continues to grow. The success of the Nationalists in the Civil War in 1939 had the effect of re-establishing in Madrid the political control which had begun to become more diffused, often in an anarchic manner, under the Second Republic (1931–6). This re-establishment, aimed, in accordance with all historical precedents, at the stifling of regionalist aspirations, has produced over the last fifteen years a great spate of new building, including extensions to the University City, blocks of flats, sports facilities and government offices.

Conclusions

This brief review of the historical development of Madrid has attempted to give an idea of those factors which have been most significant in its rise to supremacy in Spain despite the harsh, poverty-stricken nature of its environment. It is clear that the city possesses no outstanding advantage of physical site, although its situation in relation to Castile and to Spain as a whole is favourable for a capital. It is relatively well placed with regard to routes across the Guadarrama and La Mancha, and is in the geometric centre of the country. If, however, Madrid has no great advantage of site, it suffers from no great disadvantage. It has plenty of room in which to expand, a fact which gave it an early superiority over Toledo, which with a present-day population of only 40,243, remains huddled on its hilltop. There remains little doubt that political factors must be given most emphasis in accounting for the development of Madrid. From the first Cortes of 1329, through the centralized absolutist governments of Philip II and the Bourbons to the present Nationalist dictatorship, it has been the avowed policy of the rulers of Spain to maintain the unity of the country by concentrating in Madrid the administrative, and to some extent, the economic, organization of the nation. The successful implementation of this policy has been the basic cause of the continued growth of the city to reach the position of being the largest in Iberia.

The supreme political dominance of Madrid had the effect of attracting economic undertakings, which, especially since 1890, have become of increasing significance, and which have aided in the growth of the city. Thus, unlike many other cities which obtained political power because they were economically rich, Madrid acquired economic power because it was politically supreme. This fact however causes some doubt and misgivings as to the future. Except for a brief interlude when Philip III moved the capital to Valladolid and for two short periods under the republics (1873–4 and 1931–6) Madrid has been the centre of the whole of Spain for four centuries. The local autonomies granted under the Republics did not exist long enough for the loss of status by Madrid to have had any effect. If at some time in the future such autonomies should be re-established and maintained, it is an open question whether inertia would be sufficient to preserve the supremacy of Madrid.

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Teaching About U.N.O.

The Geography Teacher's Contribution

J. A. DAWSON

AS A RESULT OF EXTENSIVE EXPERIMENTS in education for international understanding, U.N.E.S.C.O. is anxious that an increasing number of teachers in all its member-states should try to introduce into their syllabuses topics or courses designed to promote in their pupils favourable attitudes towards people of other nationalities. Teachers of geography, history, and current affairs, in particular, may find that they can make a definite contribution towards achieving this aim. It is well, therefore, that those teaching geography in school should consider the relationship of their subject to these new possibilities and to examine why and how a wide study of the activities of the United Nations Organization should be introduced into the syllabus.

The ways in which geography as a school subject can help towards international understanding have long been recognized as of great importance. In recent years, it has been accepted that considerable value lies in teaching about those aspects of the United Nations Organization which have geographical appeal. In particular the

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various U.N. Specialized Agencies which are helping to raise living standards in under-developed lands come within this field of study.

Activities of organizations like the Food and Agricultural Organization, the World Meteorological Organization and the International Civil Aviation Organization often coincide with the subject-matter of geography: food and agriculture, fishing and forestry, weather study and air communications are a few instances. The geography teacher is interested in the contemporary problems of the countries he studies and although it may be argued with force that it is outside the scope of geography to consider policies in the solution of those problems, he cannot but be interested when the implementation of such policies begins to affect landscape. One may refer here to irrigation schemes, re-afforestation works, new farming methods and land development generally.

Moreover, the economic and social aspects of U.N.O.'s work are of immediate appeal to teacher and pupil alike. For the teacher there is the satisfaction of being right up to date in his subject and of making a direct contribution towards the goal of international understanding, whilst for the pupil there is great stimulus and enjoyment in learning about the everyday difficulties of other peoples and about the help which is being made available to them. The child's sympathy is easily aroused by stories of technical assistance in the world-wide struggle against ignorance, disease, poverty and hunger.

To decide the amount of United Nations studies which might reasonably be fitted into a geography course is not easy. It is suggested that the place of U.N.O. in the story of man's attempts towards international action in the settlement of disputes and problems is properly within the scope of the historian. However, children seem to find more interest in learning about actual accounts of aid given through the United Nations than in studying the structure, constitution, powers and procedure of U.N.O. itself. Because U.N. Technical Assistance operates on a world basis, helping backward countries to solve their present-day troubles, it is justifiable to suggest that greatest opportunity to introduce United Nations study naturally into the lessons occurs in the geography course when these lands are under consideration.

The best way to illustrate the type of teaching envisaged is to select a region, such as India, Pakistan and Ceylon, of which geographical study would be incomplete without reference to the age-old problems of poverty, lack of proper nourishment, over-population and the extension of the cultivated area in the quest for greater food production. Having gone this far, such study ought not to be considered satisfactory if divorced from the attempts of F.A.O. to achieve even a partial remedy of those problems.

To start with, nine countries where the staple diet of most of the population is rice have joined together to seek strains of rice best suited to their soils. At Cutlack, India, the F.A.O. has set up an International Rice Commission to experiment with hybrids. Japanese and Indian rice are crossed in an attempt to evolve a strain with the best properties of both.[1] At Array has been established the Bombay Clean Milk Scheme, a project established by the government of Bombay with the help of F.A.O. dairy experts. This project, watched by many tropical countries with interest, consists of a model dairy village which, since 1948, has grown to 30 self-contained farm units with 500 head of cattle each. The result has been an abundant supply of clean, wholesome milk for the area.[2] In Ceylon, as a result of the introduction of heavy duty machinery into the dry, thorny terrain of the Gal Oya valley, a vast land-reclamation scheme has been carried out which is now being used as an example of its kind in Asia and the Far East. Water reservoirs have been constructed and over 8,000 families settled on the land in 60 new villages.[3] Lastly, in Ceylon and along the coast of Bombay, marine engines have been fitted into local craft, thus enabling the fisherman to reach far-off fishing grounds, devoting more time to fishing and less to rowing out and back. The resulting increases in catches have been so successful that Colombo Plan funds have been used to provide many more of these engines, the loans quickly being paid off by the fishermen.[4]

The projects referred to above are just a few of the many hundreds undertaken by one agency alone, F.A.O. If the study were broadened to include the activities of some of the other Specialized Agencies such as W.H.O., and U.N.E.S.C.O., fascinating accounts would be found in the story of mankind's struggle against disease, of weather surveys and hurricane-plotting, and of programmes of fundamental education designed to enable countries with low literacy rates to benefit more from technical assistance.

Sufficient indication has been given to show that selected brief accounts of certain aspects of the work of the United Nations Organization may constitute an ideal way of following up normal geographical studies especially when the teacher is concerned with the possibilities of arousing in his pupils an interest in the problems of other peoples. The actual methods and materials available vary enormously. A wide range of visual and other aids may be obtained in adequate quantities from the information services of U.N.O. These include posters, folders, pamphlets and booklets, picture-sheets and glossy photographs as well as films and filmstrips. Detailed lists of material and catalogues of films and filmstrips are obtainable from U.N. Information Centre, Weaver House, Stratford Place, London W.1. Much useful information is also available from the Agencies themselves, the addresses of which will be provided by the U.N. Information Centre. It has been found that much of the material available was addressed to adult audiences and was unsuitable for children to read because of the technicalities of language and the paucity of imaginative writing. There are signs now, however, that this deficiency is being made good by U.N.E.S.C.O. and by Specialized Agencies themselves. In fact, in recent years, much thought has been given to the production of booklets suitable for classroom purposes and a list of some of these which the writer has found useful in presenting the work of F.A.O. to his classes is added at the end of this article. It is very interesting to read in the introduction to one of these booklets, specially designed for teachers in secondary schools, the following conclusion: "F.A.O., like the United Nations and the other Specialized Agencies, is becoming increasingly convinced that the public understanding necessary for the accomplishment of its tasks must start in the schools."

To sum up, it is not the intent of this article to add to the already copious literature on geography and international understanding, but rather to point out that in much of that literature and in the majority of textbooks far too little emphasis is placed on these activities of U.N.O. So much of the teaching in current affairs courses, conducted either separately or incidentally within the framework of geography lessons, tends to be loosely-knit and apparently themeless; almost, one might venture to say, a never-ending stream of events and topics quite unconnected with each other. R. C. Honeybone has stressed the need for careful selection of examples of 'International Affairs Geography' against the background of the whole school course, in order to avoid a "rather haphazard collection of contemporary snippets of information" masquerading as current affairs.[6]

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This Changing World

EDITED BY G. J. BUTLAND

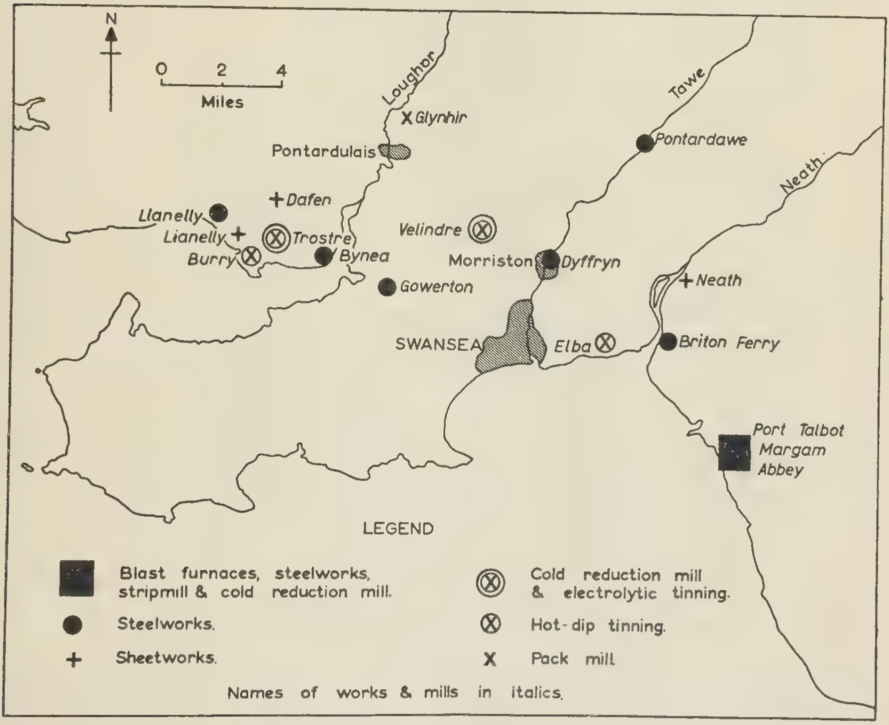
THE TINPLATE AND STEEL INDUSTRIES IN WEST SOUTH WALES

In 1945 there were over 300 handmills of the tinplate industry in operation in South Wales; in 1956, of the 100 which were still producing sheet, the greater number were located in west South Wales (see E. G. Bowen, *Wales*, London, 1957, Figure 111, p. 391). However, by October 1958 the last packmill producing sheet for tinplate—at the Eaglesbush Works in Neath—closed, and left only three handmills in production, rolling blackplate at the Glynhir Works to the north of Pontardulais. The gradual closing of the handmills had been expected since the construction of the first hot-strip and cold-reduction mills at Ebbw Vale in 1938 and the installation of an electrolytic tinning line there in 1947. Their fate was finally sealed by the formation of the Steel Company of Wales in 1947, and the subsequent building of two cold-reduction and electrolytic tinning plants—the Trostre Works to the east of Llanelly, and the Velindre Works to the west of Morriston, which were built in association with the Abbey Works, a new 80-inch hot-strip mill, at Margam. The controversy over the siting of these two cold-reduction plants away from the strip mill for sociological and political reasons is noted by W. E. Minchinton in his *The British Tinplate Industry* (Oxford, 1957, p. 237). In small measure, the hastening of the recent packmill closures can be ascribed to the opening of the new tinplate works at Port Kembla, New South Wales, and a general recession in world economic activity. However, their fate is essentially the result of the rapid running-in of the Velindre Works, which has three of Britain's six electrolytic tinning lines and the only continuous annealing line in Europe. For, rather than experiencing a failure of demand, tinplate production in this country has risen steadily and exports have increased in recent years, as the following figures show:—

Year	*Tinplate, ternplate, and blackplate production (thousand tons)*	*Exports (thousand tons)*
1950	750	248
1951	742	240
1952	899	301
1953	752	261
1954	863	303
1955	892	321
1956	918	311
1957	1035	435

The production of tinplate in west South Wales is now concentrated, therefore, at Trostre and Velindre (both of which receive their supplies of steel strip from Margam by road and rail), with the exception of the Burry Works in Llanelly, and the Elba Works in Swansea. These are two converted packmills, each associated with one of the new cold-reduction plants, and having supplementary hot-dip tinning facilities. Again, their locations are the result of sociological rather than economic factors, and they follow a pattern adopted earlier in east South Wales in the case of the Ebbw Vale works which has its hot-dip tinning plant farther down the valley at Abercarn.

There were thirteen steelworks in west South Wales in 1945, serving especially the tinplate industry with sheet bars, but with the passing of the packmills and competition from modern integrated works only six are left working today; and, in the opinion of the four-man team which was appointed by the Minister for Welsh Affairs early in 1958, and which investigated the problems of the steel and tinplate industries in the area (see *Financial Times*, June 13th, 1958, p. 9), a further contraction is inevitable. The six are the Llanelly, Bynea, Gowerton, and Pontardawe steelworks, the Dyffryn works at Morriston, and the Briton Ferry steelworks (the blast furnaces there closed on October 31st, 1958). They are engaged in the production of ingots, billets, bars, and slabs. Sheetworks have also been closed in recent years until there are now only three in operation. These are the Llanelly, Dafen, and Neath sheetworks, engaged today chiefly in the production of galvanized sheet. Early in 1958 a new continuous galvanizing line was installed at Ebbw Vale. As this line comes into full production the sheetworks of west South Wales will find it increasingly difficult to compete, and further closures seem inevitable.



Location of blast furnaces, steelworks, sheetworks and tinplate works in west South Wales, December 1958.

In contrast to this general scene of contraction and closure is the continued expansion on the site of the blast furnaces, steelworks, hot-strip mill and cold-reduction mill at Port Talbot and Margam. The present annual capacity of the four blast furnaces and twenty open-hearth furnaces is 2·4 million tons of steel, the products being medium and light steel plates, and hot- and cold-rolled sheets. The National Coal Board is planning to sink a mine at Margam (where reserves are estimated to be adequate for a century), thereby to replace from one source the present supplies of coking coal from some forty collieries. The greater part of the iron ore is imported, and, with an eye to the possible future development of bulk ore-transport, the Steel Company of Wales has joined with the Guest Keen Iron and Steel Company to form the Angle Ore and Transport Company, and has bought land for an ore-storage depot on Milford Haven at Chapel Bay, whence it is expected that the ore will be re-shipped in small carriers to the South Wales ports. Another development is the construction by British Railways of a new, automatically controlled marshalling yard between Port Talbot and Pyle. This will facilitate the movement of coal and scrap into the Port Talbot, Margam and Abbey works, and may increase the proportion of finished products moved by rail (approximately one third of the steel strip is now transported by road). Work is in progress on the Steel Company of Wales' Third Development Plan which by 1960 will raise output to 3 million tons of steel each year from these works. A fifth blast furnace and three 50-ton Bessemer converters are being installed. This expansion will confirm the Works as the largest in Europe and consolidate the importance of South Wales steel production, already producing approximately 60 per cent of the United Kingdom's steel sheet and virtually all its tinplate.

The contemporary unemployment of tinplate and steel workers in west South Wales stands in strong contrast to that experienced in the eastern valleys of the coalfield in the inter-war years: then unemployment was the result of a collapsed economy, but today it represents the success of a few modern and highly efficient works displacing an earlier technology.

University College of Swansea G. MANNERS

THE POPULATION INCREASE IN ENGLAND AND WALES, 1951–57

The *Annual Estimates of the Population of England and Wales* for June, 1957 give some indication of the trends of population change during the first half of the inter-censal period 1951–61, and enable some comparison to be made with the pre-1951 period.

The total population of England and Wales has risen since 1951 by approximately 1,132,000 to 44,907,000, a rate of growth of 2·6 per cent which is very slightly below the average for the period 1931–51. Map 1 shows the spatial distribution of the increase. The greatest concentration of population growth has been in the northern Home Counties (Berkshire, Buckinghamshire, Hertfordshire) and West Sussex, each of which increased at four times the national average. These, with those counties which increased at over 6 per cent (all in the southeast and south Midlands), form the areas into which net immigration of any consequence has taken place. This situation shows little change from that prior to 1951, the main difference being an even greater concentration on the southeast. On the other hand, Middlesex has joined London in declining in numbers.

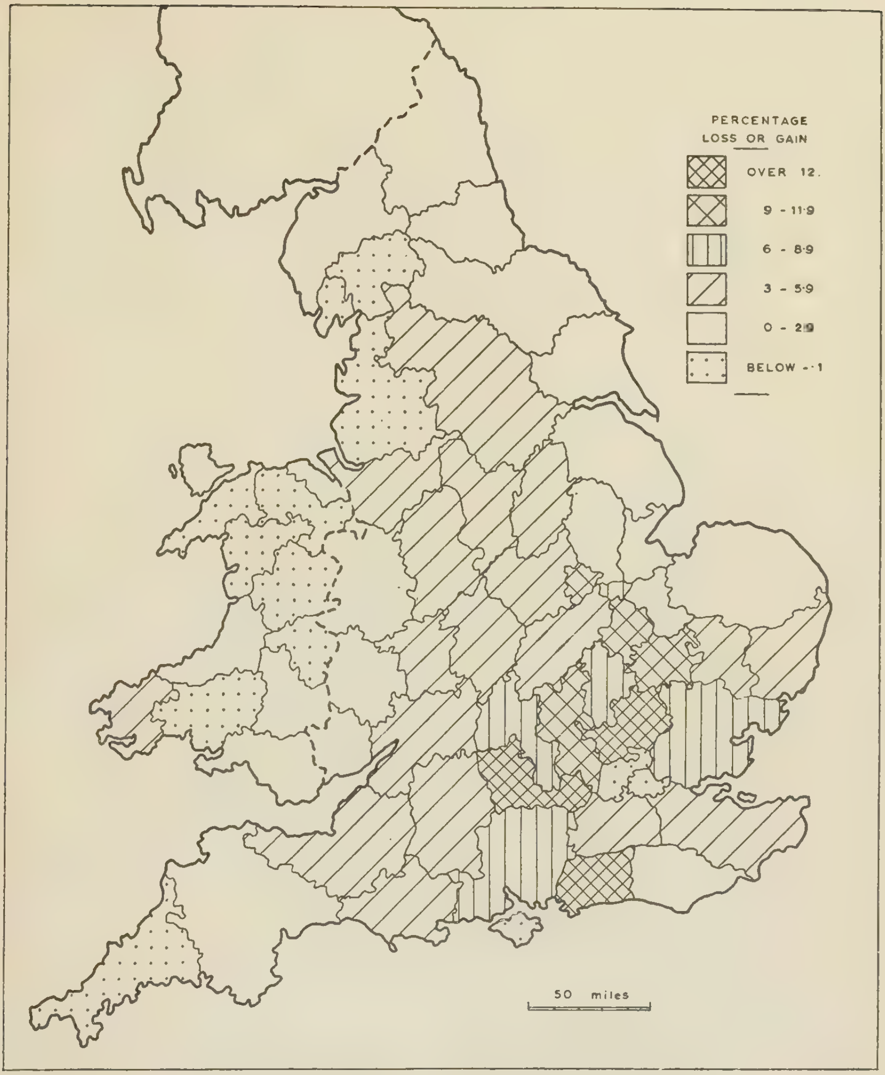


Fig. 1.—Population change in England and Wales 1951–57.

The number of counties showing slight immigration (increase of 3 to 5·9 per cent) has diminished since 1951 and become a more compact group stretching from Dorset to the West Riding. This has led to more counties showing an even smaller population growth (0 to 2·9 per cent), which in most cases means on balance an outward movement of population. They fall into two belts, the East Coast, and north-western England and Wales.

Counties showing a fall in numbers are mainly situated on the western upland fringe and London, Middlesex and the Isle of Wight. Significantly, almost without exception the counties with an unemployment rate of over 4 per cent (i.e., twice the national average) are stagnant or declining in population, most at a rate higher than before 1951.

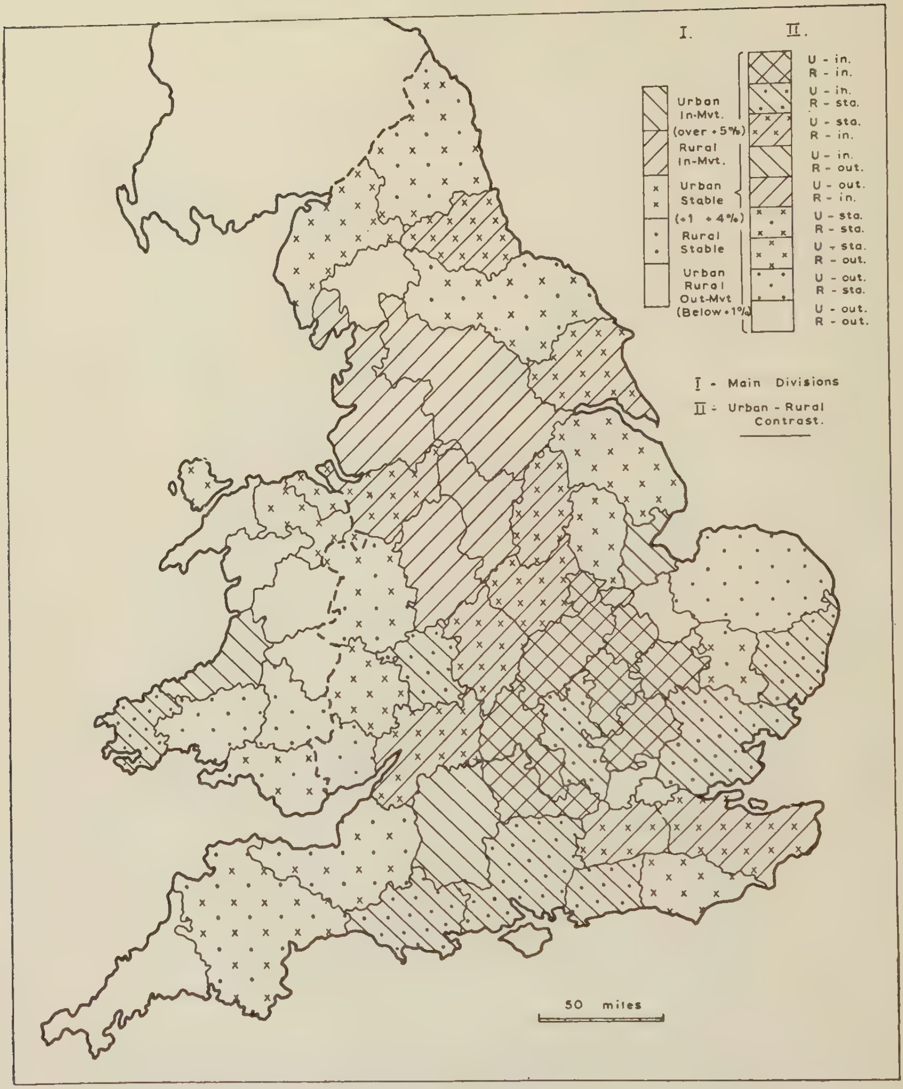


Fig. 2.—Urban and rural population movements 1951–57.

Map 2 compares urban and rural changes based on administrative areas. Where population growth for the period 1951 to 1957 is above 5 per cent immigration is assumed; between 1 and 4 per cent stability; and under 0, emigration. As might be expected, counties which have received both urban and rural population are mainly concentrated in southeast England and the south Midlands. This is a measure of their ascendancy, which is mainly due to suburban growth from London and immigration from the rest of the country. Counties showing inward movement into urban areas in association with either stable or declining rural areas are all in the Midlands or southeast England. Counties with immigration into rural areas combined with local urban decline or stability are rarely predominantly agricultural; such characteristics are mainly the result of urban dispersion industrial counties. Generally speaking urban stability, linked with rural decline, are associated with western England and Wales (e.g., Devon, Shropshire, and Carmarthen), and the rural counties of eastern England (Norfolk, Lincolnshire—Kesteven and Lindsey). Finally, counties showing emigration from both urban and rural areas are confined to Cornwall, west and central Wales, Cumberland, Westmorland, and London and Middlesex.

Thus the general population trends of England and Wales still show movement to the southeast, urban dispersion in other densely populated counties, and continued stability elsewhere.

Smethwick Technical School C. D. Morley

COTTON GOES WEST IN THE AMERICAN SOUTH

According to estimates of the U.S. Department of Agriculture, rather more than 7 million bales of the 1957 American cotton crop of 12½ million bales, or 57 per cent, were grown in Texas, Oklahoma, New Mexico, Arizona and California. Although the official Census of Agriculture is taken only quinquennially, census data support the belief that cotton production is indeed forsaking the old Cotton Belt for new irrigated areas in the American Southwest.

Prunty has shown that cotton production in the old Cotton Belt had become concentrated in seven cotton regions by 1944 ("Recent quantitative changes in the cotton regions of the Southeastern States", *Economic Geography*, vol. 27, 1951, pp. 189–208). Ten years later the five easternmost regions were declining in importance, whereas two new western areas, which had been of limited significance in 1944, must be added to the map of major American cotton producing regions. They are the Salt River valley near Phoenix, Arizona, and the San Joaquin valley of California which produced less than 4 per cent of the nation's cotton in 1944, but ten years later were growing more than 15 per cent of the total crop. During the same period the eastern areas had declined both relatively and absolutely.

Expansion in the Southwest has been achieved almost in spite of the fact that cotton acreages are strictly controlled by the government in return for supported prices. When cotton is in surplus supply, each cotton farmer is assigned an acreage "allotment" (normally some fraction of the acreage he grew in one or more base years) and he is heavily penalized if he plants more than his allotted acreage. In the few years since 1934 when acreages have been uncontrolled, however, many cotton farmers have planted cotton on every available acre, often with little thought of harvesting it, in the hope of obtaining a larger allotment in future. Thus the "uncontrolled" years have permitted western farmers to start growing cotton under irrigation.

The support price of cotton has been keyed to the small, inefficient farms of the old Cotton Belt, with their high production costs and low yields per acre. Traditionally one family can handle no more than 15 acres of cotton, and a yield of one 472-pound bale per acre was exceptionally high. With cotton at 33 cents a pound this would produce a gross income of approximately $2350, and a cut in the acreage allotment could be disastrous. In

Table I

THOUSANDS OF ACRES OF COTTON GROWN IN SELECTED AMERICAN COTTON DISTRICTS, BY YEARS

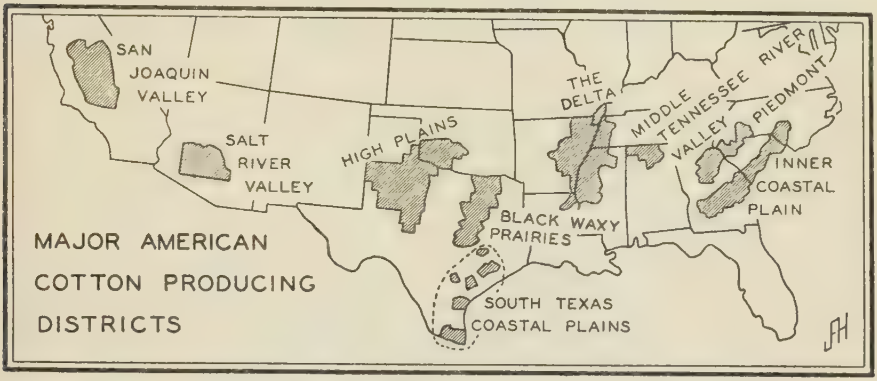
District	1954	1949	1944	1939	1934	1929	1924	1919
Inner Coastal Plain	927·0	1277·9	927·9	1161·1	1252·9	1979·3	1776·1	2308·4
Piedmont	337·0	629·9	614·9	688·8	785·9	1268·7	1016·2	1820·4
The Delta	3536·0	4931·9	3561·7	3512·9	3435·3	5236·6	4048·5	3649·8
Middle Tennessee River valley	353·8	606·3	373·6	392·4	414·4	691·8	477·9	449·0
Black Waxy Prairies	1543·8	2503·2	1932·7	2158·9	2391·8	4354·6	4729·3	3791·1
South Texas	881·3	1216·5	632·1	711·2	895·1	1176·5	977·7	652·7
High Plains	3857·1	5024·1	2931·1	3060·1	3339·2	6041·4	4255·4	1909·1
Salt River valley	332·2	306·6	112·8	153·8	107·1	153·9	129·9	77·4
San Joaquin	781·8	852·1	260·8	306·8	198·5	248·7	43·9	7·8
Nine districts	12,550·0	17,348·5	11,347·6	12,146·0	12,820·2	21,151·5	17,454·9	14,665·7
Remainder U.S.	6308·1	9250·8	7614·3	10,665·0	13,933·5	22,076·0	21,749·4	19,074·4
Total U.S.	18,858·1	26·599·3	18,961·9	22,811·0	26,753·7	43,227·5	39,204·3	33,740·1

THOUSANDS OF BALES OF COTTON PRODUCED IN SELECTED AMERICAN COTTON DISTRICTS, BY YEARS

District	1954	1949	1944	1939	1934	1929	1924	1919
Inner Coastal Plain	573·2	515·3	742·1	695·8	646·8	725·9	640·7	1058·1
Piedmont	195·8	305·9	426·6	462·3	399·5	594·6	470·4	880·3
The Delta	2980·9	3325·8	3022·3	2754·0	1766·6	2660·8	1684·3	1410·2
Middle Tennessee River valley	209·5	308·0	295·8	230·2	224·5	328·6	185·1	184·2
Black Waxy Prairies	409·9	963·3	644·9	812·7	600·4	1163·0	1433·0	998·7
South Texas	710·4	873·6	280·9	336·3	301·3	373·3	348·1	94·7
High Plains	1672·1	2852·5	1278·6	864·2	487·9	1408·0	1601·8	873·9
Salt River valley	655·5	451·2	101·3	165·0	85·7	100·3	75·8	39·5
San Joaquin	1286·1	1218·5	316·8	428·1	238·8	225·2	36·2	2·9
Nine districts	8693·4	10,814·1	7109·3	6748·6	4751·5	7579·7	6475·4	5542·5
Remainder U.S.	4228·0	4605·4	4729·1	4732·7	4720·5	6994·7	7207·3	5833·6
Total U.S.	12,921·4	15,419·5	11,838·4	11,481·3	9472·0	14,574·4	13,682·7	11,376·1

1950 70 per cent of all farmers in the old Cotton Belt had gross incomes of less than $2500 (J. V. McElveen and K. L. Bachman, "Low production farms", U.S. Department of Agriculture Information Bulletin No. 108, 1953).

The price needed to support such a farmer is ridiculously high for the large, efficient, highly mechanized irrigated cotton farm with its high yields per acre, and many South-western farmers crowded in under the price support "umbrella" designed to shelter the small South-eastern farmer.


MAJOR AMERICAN COTTON PRODUCING DISTRICTS

But increasingly heavier yields in the Southwest require ever greater reductions in acreage allotments, which tend to squeeze out the small Eastern cotton farmer. He probably would be no better off if acreage controls were abolished and the cotton price allowed to seek a free market level, because the Western farmer can produce cotton at a much lower cost.

The soil bank programme has been a boon to the small Eastern farmer who finds himself in this dilemma. Under this scheme the farmer is paid if he does not grow cotton on his allotted acreage, and he receives a bonus if his entire farm is placed in the soil bank. In 1958 approximately half the allotted acreage in the Carolinas and Georgia, and a third in Alabama and Mississippi, were placed in the soil bank, thus further reducing the cotton acreage of the Southeast, and bringing the American total to its lowest level since 1876.

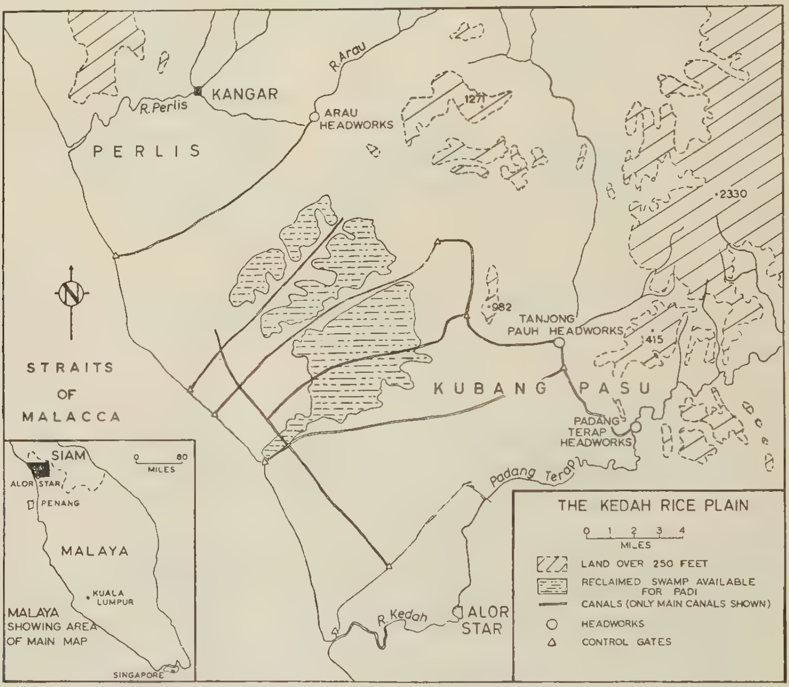
The soil bank will be beneficial if it induces more marginal farmers to leave their farms and take urban employment. It is these farmers, by and large, who have created a paradoxical surplus in shortage by producing poor-quality, virtually unsaleable cotton which had to be purchased by the government at the official support price. Although there were serious shortages of better-quality cotton in 1958, the national cotton acreage had to be reduced by law because the government held a surplus of roughly 3 million bales of this low-quality cotton.

It is unreasonable to assume that cotton will disappear in the old Cotton Belt, but it would seem that cotton production in the Southeast will be concentrated, to an increasing degree, on farms and in areas where production costs are competitive with those of western irrigated districts.

Indiana University JOHN FRASER HART

WATER CONTROL AND IRRIGATION IN NORTH MALAYA

Since its establishment in 1932, the Drainage and Irrigation Department of the Government of the Federation of Malaya has been responsible for a number of schemes which have converted many thousands of acres of previously swampy or poorly watered country into productive padi lands. One such scheme at Kubang Pasu in the northwest state of Kedah, the premier padi growing region of Malaya, is now, after ten years' work, on the point of completion. By the controlled draining of country in the Padang Terap basin which was previously swampland, 20,000 acres have been added to Kedah's cultivable area. Other aspects of the scheme are the exclusion of sea water (often a problem in this flat and extremely low-lying alluvial country, especially at high tide), flood prevention, and particularly the improved watering of a large area.



The Padang Terap is one of the major rivers of Kedah and its headstreams rise high in the Central Ranges of Malaya. Owing to the monsoonal climatic régime of north Malaya, however, and since the river's catchment area lies on the western side of the mountains, its flow fluctuates considerably. Only some 15 to 20 per cent of Kedah's annual rainfall of about 80 to 90 inches falls in the four months December to March, and at this time the rivers are at their lowest. The flow of the Padang Terap may fall as low as 15 cubic feet per second, a quantity that is negligible for irrigation in relation to the area that is under padi, and which is barely sufficient for the domestic water supply of the nearby town of Alor Star which is drawn, lower down, from the same stream. By contrast, the river's maximum flow in October and November usually exceeds 6000 cusecs for short periods.

Water for the Kubang Pasu scheme is supplied from two headworks, a major one on the Padang Terap, and a secondary one on the Tanjong Pauh. These headworks, a combination of weirs and sluice gates, allow the diversion for irrigation purposes of all available water which previously flowed into the Kedah River and was thus lost to the sea. The water for irrigation will be led by a newly constructed main canal into the completed network of combined irrigation and drainage channels that criss-crosses the coastal plain of north Kedah, and will augment their water supply. The north Kedah padi area continues unbroken across the state border into the neighbouring tiny state of Perlis, where a similar but smaller scheme serves the padi area of south Perlis, using the limited supply of water available in the Arau River.

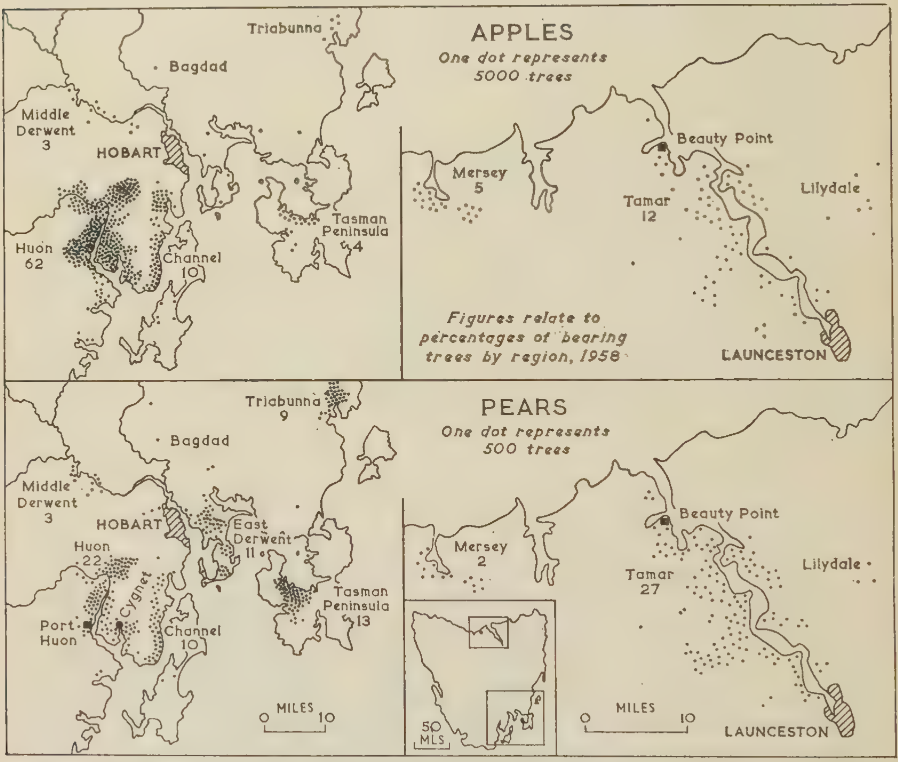
In addition to its drainage and flood control aspects, the scheme will benefit about 80,000 acres by the provision of some irrigation water and of a more reliable control of water levels, and thus undoubtedly increase padi yields over this acreage. Already, partly as a result of other and similar schemes, the latest (1957/8) record harvest of over three-quarters of a million tons of rice is nearly 70 per cent of Malaya's present annual consumption and almost 50 per cent above the pre-war average production. In view of these increases, it seems that the government aim of self-sufficiency in rice may not be over-ambitious, although the final 30 per cent increase will be a much more difficult proposition than achievements so far, especially as the rate of population growth in Malaya is very rapid.

Alor Star, Kedah P. P. COURTENAY

THE TASMANIAN APPLE AND PEAR INDUSTRY

In 1958, largely owing to a bumper harvest of pome fruits in Tasmania, Australia exported to Europe a record total of 5,515,000 cases of apples. To this total Tasmania contributed a record 4,090,000 cases, Western Australia 710,000, South Australia 314,000, Victoria 291,000, New South Wales 93,000, and Queensland 17,000. The United Kingdom took 3,773,000 cases (London 60 per cent, Liverpool 25, Hull 10, Glasgow 5), Sweden 679,000, Germany 405,000, the Netherlands 323,000, Norway 148,000, Belgium 118,000, and Finland 69,000. Thus Tasmania furnished no less than three-quarters of the exports and the United Kingdom took more than two-thirds.

But although Tasmania enjoyed a bumper harvest, the apple-bearing area (16,500 acres) was the smallest for nearly 50 years. A peak of 26,000 acres had been reached in 1922, a year marking the end of a post-war boom in speculative plantings mainly along the Tamar valley. Since then, the total area has declined fairly steadily, though the rate of decline has accelerated since the last war. The high price of wool and dairy products, together with the pull of secondary industry for labour from the densely settled orchard areas, has led to many low-yielding orchards being grubbed up in marginal districts. Of the major producing areas, however, only the D'Entrecasteaux channel district south of Hobart has declined rapidly over the past decade. There, orchards are giving way to dairying, and as a result, the district ceased to rank as the second-largest apple producer in 1953. Nevertheless, all producing districts, including the Tamar valley which now ranks second, have shared in the decline. In the Huon valley, which is still by far the leading district, the 'centre of gravity' is shifting southward as orchards near Hobart make way for dairy pastures and as new plantings in the south come into production. Neither the Mersey valley nor the Tasman peninsula has suffered much loss, but the decline has been substantial (up to three-fifths of the 1948 acreage) in the drier areas of the middle Derwent and in the outlying areas of the northeast.



Among the Australian states Tasmania ranks second to Victoria as an exporter of pears. In Victoria pears are grown mainly around Doncaster, east of Melbourne, and on a large scale for canning in the irrigated Goulburn valley. In 1958, of the 1,421,000 cases of pears shipped from Australia to Europe, Victoria exported 955,000, Tasmania 440,000, South Australia 17,000, and Western Australia 9,000. The United Kingdom took 1,124,000 cases, Sweden 226,000, Belgium 30,000, Norway 26,000, and Germany 15,000. Thus Tasmania furnished just under one-third of the exports and the United Kingdom took no less than four-fifths.

The pattern of pear production in Tasmania has also shown some significant changes. From 1922 to 1948, the bearing area stayed fairly constant at approximately 2000 acres, but since 1948 it has fallen to 1500 acres, the lowest for 40 years. The decline has been greatest in the Huon valley, which in 1952 yielded pride of place to the Tamar. Although the Huon is ideal for apples, it is cooler, wetter, and less sunny than the Tamar, which thus enjoys a comparative advantage for pear production. Probably the best areas for pears, however, and certainly the sunniest, lie along the east coast, and these areas have even recorded a slight increase in acreage. The decline has in fact been greatest in the two main producing districts, so that with increases at Triabunna and on the Tasman peninsula, production has tended to spread more evenly among the various areas. This trend is likely to continue, since pear orchards are generally older in the Huon and the north, and recent plantings are largely confined to the east Derwent, the Tasman peninsula, and the east coast. Canning-pears assume some importance in the drier irrigated areas, notably in the north, at Triabunna, and in the middle Derwent. Pears are more important than apples only along the eastern shores of the Derwent estuary.

Three ports handle all the exports. In 1958, out of the total apple and pear shipments to Europe, Hobart handled 2,984,000 cases, Port Huon 808,000, and Launceston (Beauty Point) 738,000. Soon after the first shipment of fruit to Europe in 1888, Port Huon and Port Cygnet became important exporting ports, but with the development of lorry transport to Hobart, the Huon ports were closed in 1937. In 1953, however, a new wharf was completed at Port Huon, and the re-opening of this port at the mouth of the Kermandie River has since been a further factor in the southward shift of apple production in the Huon.

Exports from Tasmania to Europe normally absorb between 40 and 65 per cent of the apple crop and 75 per cent of the pear crop, but although these proportions are much the same today as in the thirties, disposal of the balance has changed considerably. In pre-war years, the bulk of the surplus was sent to the mainland, chiefly to Sydney, Brisbane, Melbourne, and Newcastle, but the development of factory processing during the war and increasing competition on mainland markets since the war has led to a decline in shipments interstate. They now amount to little more than 10 per cent of the apple crop and less than 5 per cent of the pear crop. Apart from small shipments to Asia, the rest of the crop is processed in canning and drying factories in the Huon and Channel districts.

University of Tasmania PETER SCOTT

New Textbooks for Secondary Schools

L. J. JAY

Among the new books published during the last year or two which have been sent to the Association for review, a good proportion consist of school textbooks. Since limitations of space in the review pages of *Geography* preclude a separate notice for each of these, teachers may find a collective note of use when they are considering replacements and additions to their stocks. The following details of textbooks for secondary schools may be regarded as a supplement to the survey of new issues which appeared in this journal a year ago.

Within this field of literature one can usually distinguish books which have been written for use at the Advanced level, but it is less easy to classify works produced for children between the ages of 11 and 16, owing to the wide range of ability encountered in the different types of secondary school, and the varied methods of presenting the subject-matter of geography. Nevertheless it is possible to group the new titles into a few broad categories, for convenience of description.

Firstly, there are orthodox grammar school texts covering material up to Ordinary level of the G.C.E. These are termed orthodox because they follow the conventional pattern based on the regional treatment of one continent after another for the major part of the five-year course, with perhaps one or two years devoted to selected aspects, physical or human, of general world geography. By this approach, subjects such as land-forms, climate and crop-production receive treatment at appropriate points in the sequence of regional studies. Nelson's Geography Texts, edited by Prof. W. G. East, are planned to cover the full G.C.E. syllabus in ten volumes. In 1958 Books 9 and 10 appeared as the first publications of this new series: *World Geography Human* by a former President of the Geographical Association, L. S. Suggate, x+326 pp., 12s. 6d., and *World Geography Physical* by G. H. Dury, xi+178 pp., 8s. 6d. These attractive volumes containing many new photographs and sketch-maps, with topics for discussion listed at the end of each chapter, are intended to supplement the detailed regional studies which will be covered in the other books to be published. They cater for the more mature pupil who is on the threshold of Advanced level work. *The British Isles* by A. Ferriday, xii+284 pp., 12s., published by Macmillan, gives a detailed treatment of the homeland for O. level candidates. A brief introduction is followed by twenty regional studies, with concluding chapters on agriculture and industry in general. University Tutorial Press have recently issued four *Studies and Exercises in Human*

▶ Mr. Jay, Honorary Librarian of the Geographical Association, is a lecturer in the Department of Education, University of Sheffield. His earlier review, "Textbooks for Secondary Schools, New Titles and Trends", appeared in *Geography*, vol. xliii, January 1958, pp. 47–50.

Geography, all written by D. C. Money, with drawings by W. R. Dalzell. Book I concerns *Africa*, book II *Australia and New Zealand*, book III *Southern Asia* and book IV *The British Isles*. All have 48 pages, of the larger size common to the sketch-map geography texts, 8½ by 10¾ inches, and cost 4s. 6d. each. There are numerous clear photographs, maps, diagrams and line-drawings, roughly two on every page, and the text, in effect, provides extended captions to accompany the illustrations.

In this same major group are several additions to existing series. *Geography for Schools* edited by R. C. Honeybone, published by Heinemann, now has its second volume in print. This is *The Southern Continents*, by R. C. Honeybone and B. S. Roberson, viii+336 pp., 10s. 6d. There are more than 280 photographs, maps and diagrams, whilst numerous exercises are interspersed among the text as well as at the ends of chapters. The series published by English Universities Press under the title of *General School Geography*, written by J. S. Hobbs, has recently issued volume 1; this is called *Maps and Regions: an introductory course*, viii+143 pp., 8s. 6d. There are nearly 100 illustrations together with an index and a glossary of British place-names. *Homelands of Western Europe* by R. W. Brooker, 319 pp., 12s. 6d., is another volume of *The Charter Geographies* published by Harrap & Co. This detailed text deals with Scandinavia, Switzerland and countries from Germany westwards, but excludes the Iberian and Italian peninsulas. *Physical Geography*, 130 pp., 6s., is one more volume in the series of *Secondary School Geographies* written by P. T. Silley and published by Schofield & Sims Ltd. With a page size larger than usual (6½ by 8 inches), this book deals with land-forms but not with climate; the text is accompanied by numerous photographs and diagrams. One hundred and thirty-five questions are listed at the end of the book and page references are given to relevant photographs in the other volumes of this series.

Revised editions appeared during 1958 of three books which have been on the market for several years. *Asia* by W. B. Cornish, 228 pp., 6s. 9d., is the 5th edition of the work first published in 1949 in the *Modern Geography* series by the University Tutorial Press. *The Homeland—Great Britain and Ireland* by R. W. Brooker, 317 pp., 9s. 6d., reaches its 3rd edition in *The Charter Geographies*, published by Harrap & Co. *A Sketch-Map Geography for School Certificate*, by J. H. Walker, 140 pp., 7½ by 10 inches in size, 10s., retains its pre-war title although the contents of this 2nd edition have been brought up-to-date. Published by Edward Arnold Ltd., this regional geography of the whole world has maps on almost every page, with accompanying notes and some examination questions.

The next group of new books is also designed for use in grammar schools but they differ from the texts listed above in the treatment of the regional material. They are, in effect, selective rather than comprehensive studies of the areas concerned, and they represent additions to series which were begun before 1958. The first two books of the *Oxford Visual Geographies*, edited by Audrey Hicks, were mentioned in the review a year ago. The two other titles are now available; *The Eastern Lands: Asia except the U.S.S.R.* by A. T. A. and A. M. Learmonth, 128 pp., 17s. 6d., and *South America* by G. Pendle, 96 pp., 15s. These publications of the Oxford University Press are Crown Quarto in size, i.e. 7½ by 10 inches, and do not profess to cover every part of the continent concerned, but aim to give detailed sample studies of selected regions and topics. Each book can be opened at random to a complete chapter occupying two facing pages, all bearing photographs, drawings or two-colour maps to supplement the text, which is informative and stimulating. *A Pictorial Survey of England and Wales*, published by George Philip & Son Ltd., is also a series of special studies in which photographs, maps and diagrams are effectively employed to describe the essential geographical features of a region. Two further sections of this *Survey* were issued during 1958: section V, *Lancastria and adjacent areas* by Dr. H. Thorpe, 36 pp., 7s. 6d., and section VI, *The West Midlands* by Professor M. J. Wise, 32 pp., 7s. Each may be described as an album of photographs, and since the pages are of foolscap size, 13 by 8 inches, some of the panoramas are nearly a foot wide. A large number of the photographs are either overprinted with explanatory captions or accompanied by outline drawings which indicate geological outcrops and the relation of settlements to structure. The text is concise yet informative, an admirable supplement to the illustrations, and there are useful references to further reading. Although the price may prohibit their use by large classes, these books could be employed to advantage by small Fifth and Sixth forms in conjunction with the relevant large-scale maps of the Ordnance Survey. *Fundamental Geography*, published by University of London Press under the editorship of L. Brooks, was designed to provide a course for grammar schools using a new approach, and the publication of the two volumes which completed the series was mentioned in last year's review. Since then book I of this series, *Many People in Many Lands* by D. M. Forsaith, 208 pp., 7s., has gone into a 3rd edition. It is appropriate to mention this book here, for it serves as an introduction to the five-year course by presenting a number of sample studies representative of the British Isles and the major regions of the world. Numerous photographs, maps and drawings add to the value of the text and the material of this book could readily be adapted to suit many types of pupil.

The remaining category includes new series designed principally for use in secondary modern schools. *North Atlantic Neighbours: Britain, Canada, U.S.A.* by Dr. D. W. Shave, 166 pp., 6s. 6d., is book I of *The Life and Livelihood Geographies*, edited by Dr. Shave, published by John Murray. Specimen chapter headings are "The butcher and greengrocer" or "Supplying the shops", and numerous combined "maps-with-drawings" supplement the photographs and text; one map locates all the leading professional soccer clubs in relation to coal-mining counties. The rest of the world will be covered in three further volumes. *New Ventures in Geography* by H. M. Spink and R. P. Brady, published by Schofield & Sims Ltd., is a series which, when complete, will comprise five books for the "non-examination secondary school pupil". *The Foundations*, 200 pp., 7s. 6d., and *The Map-Reading Book*, 76 pp., 5s., were issued in 1957; the latest to appear is *The Southern Lands*, 216 pp., 7s. 6d., in 1958. These books make good use of maps, diagrams and pictures, whilst topics for discussion appear on almost every page. *Concentric World Geography*, edited by R. C. Kiloh, is a series of four books all published late in 1957 by Cassell & Co. This provides a four-year course for Modern schools, in which the whole world is considered each year from a particular viewpoint. Book I by D. H. Tribe, 176 pp., deals with foods; book II by H. R. Warden, 168 pp., is concerned with timber, minerals and hydro-electricity. Manufacturing industries are treated in book III by W. Wallace, 165 pp., whilst Miss D. M. Kerridge writes about transport and tourism in book IV, 179 pp. Each of these volumes costs 7s. 6d., and contains six topics or themes, i.e. two for each school term. Every topic is described in relation to three characteristic regions chosen from the British Isles, Europe and elsewhere. This approach thus reverses the orthodox treatment by bringing in regions to illustrate the subjects of geography instead of vice-versa. It lends itself to the project method, which may also be used with the series *Essential Geography* by W. G. Moore, published by Hulton Educational Publications. Three of these titles were mentioned last year, and during 1958 *Transport*, 127 pp., 7 by 9½ inches, 7s. 6d., has appeared. It resembles the others in having photographs on almost every page, and several maps.

Manufacturers of ladies' ready-made coats and dresses in the United States employ more than 120 different sizes in an attempt to satisfy the feminine demand for clothes in a wide range of shapes and lengths. A similar problem of getting a good fitting confronts the teacher who seeks a set of books tailored to his or her course, for there are as many ways of dealing with the subject-matter of geography as there are people who teach it. The question of cost is equally pressing and may in the last resort over-ride content and quality. There is perhaps no such thing as an ideal textbook, except for the handful of authors who use their own books in class whilst they are still practising teachers. For the rest, buying a book to fit one's syllabus is like choosing a ready-made coat; after selecting the one which comes nearest to requirements, a little adjustment here and there may be necessary. It is fortunate for the geography teacher that a wide range of textbooks is available from publishers who are alert to current demands. The variations in approach and in the degree of detail which characterize the sample of geography books listed above should go a long way towards meeting the needs of the individual teacher in a secondary school.

The Geographical Association

ANNUAL REPORT 1958

This has been a year of steady consolidation and expansion, as our record of membership and the financial statement amply show. Membership has again risen, from 4366 in 1957 to 4610 in 1958, and of this increase almost all has been in the category of full members. It is our hope that during the present year we shall reach a total of at least 5000 members, which would be an increase during the past 5 years of more than 1000 members. We shall welcome most warmly any help which members and branches can give to help us to reach this target.

Favourable though our affairs may seem to be at first sight, none the less in the minds of your officers the present situation gives rise for real concern rather than complacency. We have now virtually outgrown the accommodation generously made available to us by the City of Sheffield, and we are in desperate need not only of more room but also of additional clerical staff, to keep pace with the ever-mounting volume of business that we are called upon to undertake. Our Assistant Secretary and senior clerk have for long been very hard pressed and, indeed, overworked; they cannot be asked to shoulder any more responsibilities without additional assistance. A substantial influx of new members might go some small way towards meeting the very heavy burden of new expenditure which it seems clear we shall have to face in the near future. But our present annual subscription allows only a very small margin per head for the overhead maintenance of the Association and its work; the rest is needed to meet the cost of production and distribution of our journal in which we justly take pride. The desirability of considering a further increase in the annual subscription would seem to be a matter of urgency, since, even with 5000 members, on this basis our income will fall far below our financial needs.

To our retiring President, Professor R. O. Buchanan, a word of special thanks is due for the characteristic cheerfulness and kindliness he has shown while shouldering the burdens of office and presiding at our many meetings. He has attended most assiduously to our work and to the demands we have made upon him. We look forward to his counsel and help for many years to come as a senior and greatly valued friend of the Association. He is succeeded in office by one known personally to numerous teachers of geography in all spheres of education—Professor J. A. Steers of the University of Cambridge; to him we extend our sincere greetings on taking office.

The work of the Association has proceeded according to its normal pattern. Among the 55 working branches, there is yet another new one—the Crewe and Nantwich Branch—and attempts are being made to revive activities in North Lancashire. Branch reports bear testimony to much lively activity and crowded meetings with, in some cases, as at Birmingham, interesting ventures such as the institution of special "refresher courses" for teachers, in which lecturers dealt with new material of interest and value to geographers in several fields within the subject. We are, as always, most grateful to our branch officers for their indefatigable labours in the interests of the whole Association.

A very successful Annual Conference was held last January in London, with the general theme of Urban Geography, directed by Mr. R. C. Honeybone and Dr. J. H. Bird, the Honorary Conference Organizers. At the Spring Conference at Aberystwyth Professor E. G. Bowen and his able team of geographers brought to a large gathering of members a refreshing breath of Celtic geography. Two very successful summer schools were held—one in the Scottish Highlands, led by Professor J. Wreford Watson and Professor D. L. Linton, and one in the Middle Rhinelands, led by Mr. T. H. Elkins and Dr. E. M. Yates. We owe a very great debt to all these leaders who have given so generously of their time and energy not only in the field but in the time-consuming efforts that are concerned with the preparation of conferences and summer schools months ahead of their taking place. Preparations are already well in hand for the next Spring Conference, at Leicester under the direction of Professor Norman Pye, and for summer schools next August, in Switzerland with Mr. Honeybone, and in Spain with Dr. Houston.

The work of the several committees of the Association has proceeded as usual and only a fragment of the year's business can in fact be indicated in this report.

The *Executive Committee of Council*, apart from routine business, has been concerned with a project for the publication of a new series of booklets, descriptive of the country depicted on selected Ordnance Survey maps. It is hoped that this series will be a very important and valuable service to school geography; it will replace the sets of O.S. map extracts formerly published by the Association. We are fortunate in having secured the help of Professor K. C. Edwards as director and editor of the series.

The *Primary Schools Section Committee* has been working jointly with members of the Training Colleges Section on final drafts and planning of the new publication designed to supersede *Geography in the Primary School*. This entirely new text is now in the press and will be published shortly under the title *Teaching Geography in Junior Schools*.

The *Public and Preparatory Schools Section* has, during the past year, reached its highest level of membership. The section Conference was held in April at Cambridge and during the meeting the Steers Prize for competition by boys in preparatory schools was announced; the first competition was held in 1958. Three issues of the section's Notes and Queries were distributed.

The *Secondary Schools Section Committee* collaborated in the Annual Conference programme by the arrangement of a demonstration lesson and field excursion. As a result of the Geography Room Survey undertaken in 1957 and the publication of a report on the survey, interest in geography room provision has continued; an exhibition of plans and photographs displayed at the Annual Conference 1957–58 has been deposited at our headquarters office for reference, and it is expected that a supplement to the Ministry of Education's Building Bulletin will include specifications for geography rooms. Discussions on advanced level syllabuses and members' inquiries about teaching problems have also occupied the Committee's attention.

The *Training Colleges Section Committee* has had a very active and varied year. Apart from the work of various members of the committee on research projects and the preparation of material for publication, the Section has held three conferences. Of these, one was concerned especially with television broadcasts to schools, when a representative of the B.B.C. introduced telerecordings of school television broadcasts. At a meeting held at St. John's College, York, there was a discussion on the new three-year training college courses. The third conference, held in London and very well attended, was concerned with a discussion on the significance of aerial photographs in geographical studies and teaching.

The *Further Education Section Committee* has held two meetings and has been working for the recognition of geography as a Liberal Study in technological courses. A second Bulletin of abstracts from journals has been distributed to section members and a week-end meeting of members was held at Malvern during October.

The *Standing Committee for Urban Spheres of Influence* reports progress with the collection of data for the Scottish lowlands.

The *Standing Committee for Visual Aids in the Teaching of Geography* again organized an extensive exhibition for the Annual Conference, including a display of teaching materials and work done in schools, projection apparatus and new filmstrips (kindly loaned by the National Council for Visual Aids in Education) and arrangements for viewing selected films. Members of the committee have prepared articles on visual aids in geography teaching for publication in official journals and have assisted in the production of geography films, filmstrips, wall charts and other teaching aids.

The *Standing Committee for Field Studies* has worked on the organization of summer schools and has answered members' inquiries about field work. New records have been established at headquarters, with the co-operation of a number of members, of centres and accommodation suitable for use by parties of students and school pupils on field work excursions. The Committee hopes also to assist in the development of schemes for land form mapping and to this end assisted in convening in Sheffield an initial meeting of some of the interested teachers from schools and universities.

Our journal *Geography* continues to hold a high place amongst current geographical literature, thanks to the fine work of our editor, Professor D. L. Linton, and of the editorial board. During Professor Linton's absence in the Falkland Islands and New Zealand, throughout the present session the duties of editor are being shared by the members of the editorial board.

The Association's Library continues to serve a large number of members, students and schools, and new bibliographic records are gradually being built up. These include regional bibliographies for the British Isles and a card index of articles published in geographical periodicals. Work has continued on the publication of the library catalogue in sections; to the two parts already published (*Asia* and *Africa*) is now added a large catalogue, *North and Latin America.* We are very grateful to the Honorary Librarian, Mr. L. J. Jay, for his hard work in carrying out the necessary revisions and cataloguing which these publications entail.

Despite the enlargement of routine office and library work that has accompanied the increases in membership, the output of publications and the gradual widening of our services to members, there has been no increase in the staff at headquarters. The loyal hard work of that small band must not go unacknowledged.

No adequate measure of the immense amount of work, nor any real indication of the varied nature of that work, carried out at headquarters, by the sections and by the branches, can be properly incorporated in this brief Annual Report. We are a very live organization—as the continuous stream of correspondence at headquarters always makes evident—and to all those who help in so many ways to maintain and expand our vigour and our activities, very sincere thanks are extended.

ALICE GARNETT
Honorary Secretary

December 1958

PRESIDENTS OF THE ASSOCIATION 1959 AND 1960

To Professor J. A. Steers a warm welcome is extended on his taking office as President for 1959. At the meeting of Council held on 30th December 1958 Professor A. Austin Miller, of the University of Reading, was elected as President-elect for the year 1960.

ELECTION OF MEMBERS OF COUNCIL

The following four members were elected at the Annual General Meeting to serve on Council for the years 1959–60, replacing retiring members: Mr. P. J. M. Bailey (Birmingham Branch), Mr. E. B. Dobson (Winchester Branch), Mr. G. S. Hall (Crewe and Nantwich Branch) and Mr. A. F. Martin (University of Oxford) Two members already serving on Council were elected to serve on the Executive Committee—Miss E. Gilmore (Westminster Branch) and Professor N. Pye (University of Leicester).

ANNUAL CONFERENCE 30TH DECEMBER 1958 TO 2ND JANUARY 1959

This Conference will certainly be long remembered as one of the best ever held. It was attended by a record number of members, some 500 crowding the theatres at every lecture. Apart from a meeting held jointly with the Royal Geographical Society and the Institute of British Geographers, when Dr. H. Lister, chief glaciologist to the Trans-antarctic Expedition, spoke on the Antarctic snow and its climate, a lecture by Professor Wooldridge on Recent thought and speculation on the major relief features of the earth, and a discussion on the use of Ordnance Survey maps in schools, the meetings were all related to the general theme of agricultural geography. These included a thoughtful Presidential address by Professor R. O. Buchanan and outstanding lectures by Professor A. N. Duckham (University of Reading) on the Current agricultural revolution, by Dr. L. Dudley Stamp on British agriculture and the use of common lands, and Mr. H. Elvin (Director of the University of London Institute of Education) on Under-developed countries. Professor H. G. Lebon (University of Khartoum) spoke on Agriculture and pastoralism in the Nile lands, Dr. W. R. Mead (University College, University of London) on Problems of farming in northern Scandinavia, and Dr. L. Symons (Queen's University, Belfast) on the Intensification of Ulster agriculture. The Secondary Schools Section organized a valuable series of discussions on the use of Farm Studies in school geography, led by Miss I. V. Young, Mrs. I. A. Blackley and Mr. L. Clark. The meeting was concluded with a geographical film display, followed on Friday by a very full programme of excursions mainly concerned with aspects of agricultural geography studied in the field.

To the Royal Geographical Society sincere thanks are due once again for the lavish hospitality extended to us on the occasion of the joint meeting, and to the Governors of the London School of Economics for the facilities afforded to us in the School's premises, including the holding of our Annual Dinner, which was attended by more than 100 members.

It is quite impossible to express adequately the immense debt that we owe to our very able conference organizers, Mr. R. C. Honeybone and Dr. J. H. Bird, whose indefatigable labours coupled with unswerving good humour made this conference such a brilliant success. Few persons can know, though perhaps some can assess, the prodigious amount of detailed advance work that goes to the planning and execution of a programme involving so many facets, ranging from dealing with publishers and exhibitions, lecturers and programme arrangements, to social functions, residential facilities, excursions, business meetings, and many other matters. To Mr. Honeybone and his very able assistant, we extend hearty congratulations and our very warm thanks.

SPRING CONFERENCE 1959

The Spring Conference will be held at Leicester under the direction of Professor Norman Pye, from 31st March to 4th April. The arrangements for the programme are being undertaken jointly by the Department of Geography of the University of Leicester and the Leicester Branch of the Geographical Association. Programmes and application forms were issued to all members in January; inquiries for accommodation or conference attendance should be addressed to the Conference Organizer, Miss M. Oughton, Geographical Association, The Park Branch Library, Duke Street, Sheffield 2.

SUMMER SCHOOLS 1959

Inquiries for vacancies in the Summer School of Mediterranean Geography, August 12th to 27th, in Spain, and in the Summer School of Alpine Studies from August 18th to September 2nd, at Orsières, Switzerland, should be sent to the Assistant Secretary at headquarters office. The programmes of work on both courses will include active field work.

AGRICULTURAL GEOGRAPHY

It is planned to publish in the next issue of *Geography* articles based on papers read at the Annual Conference 1958–1959. These will include "The Current Agricultural Revolution" by Professor A. N. Duckham, and "Farm Studies and Geography Teaching" by Mrs. I. A. Blackley (primary schools) and Mr. L. Clark (secondary schools). A new booklet *Farm Studies and the Teaching of Geography* by I. V. Young, published by the Association of Agriculture, will be reviewed in the same issue.

G.A. PUBLICATIONS

Orders for *Teaching Geography in Junior Schools* can now be accepted at headquarters office. This new publication costs 3s. 6d. (post free) for direct orders; for orders for 50 or more copies, the price is 3s. per copy. Lecturers in training colleges are urged to order without delay while stocks are plentiful.

The recently published third section of the Library Catalogue—*North and Latin America*—has proved to be very popular. It can still be supplied (3s. 6d. post free) as can the catalogues for *Asia* (2s. 6d.) and *Africa* (2s.).

Steel Review

The quarterly publication of the British Iron and Steel Federation includes in No. 11 (July 1958) an article, with diagrams and statistics, on the siting of British steelworks; and in No. 12 (October 1958) an illustrated article on new processes in iron and steel making (with diagrams of steel converters) and "Steel for the Commonwealth", a statistical picture of Commonwealth steel markets, resources and production. The January 1959 issue (No. 13) contains an article on Consett Iron Co., County Durham and a survey of political, economic and industrial changes taking place in "Middle Africa". *Steel Review* is obtained from the Information Officer, B.I.S.F., Steel House, Tothill Street, London, S.W.1.

FIELD STUDIES COUNCIL REPRINTS

In its Annual Report in recent years the Field Studies Council (formerly the Council for the Promotion of Field Studies) has published a number of articles of geographical interest in connection with its field centres. Reprints of some of these articles may be purchased from the Wardens of the field centres as follows (payment must be sent with orders):

"Shingle Street", by R. T. Cobb, from the Warden, Flatford Mill Field Centre, East Bergholt, nr. Colchester, Essex. 1s. post free.

"Intertidal Distribution" from the Warden, Dale Fort Field Centre, Haverfordwest, Pembrokeshire. 1s. 2d. post free.

INFORMATION ON THE U.S.S.R.

The preparation of a Bulletin of Material on the geography of the U.S.S.R. has been undertaken by a small group of university geographers; the first three issues are already available—1. Agricultural statistics, by C. A. Halstead, University of Glasgow; 2. New economic regions in the U.S.S.R., by J. P. Cole, University of Nottingham; 3. Industrial Statistics by J. P. Cole. Future topics to be covered by the Bulletin include: bibliography of material in English on the Soviet Union, transport and communication data and population figures. The Bulletin is prepared from material selected from Soviet geographical and other publications, usually available only in Russian, often difficult or costly to obtain. Geography teachers interested in the U.S.S.R. will be grateful to the authors of this enterprise and they can support it by subscribing 3s. 6d. which covers the first set of bulletins (including postage). Subscriptions and inquiries should be sent to J. P. Cole, M.A., Department of Geography, the University, Nottingham, mentioning this note in *Geography*.

THE GEOGRAPHICAL ASSOCIATION

BALANCE SHEET

31st August, 1958

	£	s.	d.	£	s.	d.	1957 £
Accumulated Fund							
Balance as at 31st August, 1957	680	16	4				86
Add Surplus for the year as per Income and Expenditure Account	452	4	2				595
				1,133	0	6	681
General Reserve	1,331	1	9				—
Add balance from Study Courses and Conferences Account	414	0	0				
				1,745	1	9	1,331
Subscriptions paid in Advance				317	10	10	498
Sundry Creditors							
Geography 2 Issues	1,188	19	3				461
Summer School	163	8	8				96
Sundry	378	2	5				293
				1,730	10	4	850
				4,926	3	5	3,360
Publications Reserve Fund							
Balance as at 31st August, 1957	1,623	11	0				1,420
Add Surplus on Map Sales Account	–	–	–				172
Interest for the year	52	3	8				32
	1,675	14	8				1,624
Sundry Creditors	–	–	–				12
				1,675	14	8	1,636
Carried forward				£6,601	18	1	4.996

	£	s.	d.	£	s.	d.	£	s.	d.	1957 £
Accumulated Fund Assets										
Debtors										
Summer Schools Account ..	213	15	6							291
Sundry	565	19	3							444
				779	14	9				735
Stock of Special Publications				263	10	10				359
Office and Library Furniture and Equipment										
Estimated Value, 31st August, 1951	150	0	0							
Additions since	772	8	1							
	922	8	1							
Less Depreciation to date ..	241	3	1							
				681	5	0				320
Investments										
£200 3% Savings Bonds 1965/75, at par .. (Approximate Market Value 31st August, 1958 £144.)				200	0	0				200
Cave Austin and Company Limited—1,265 5% Cumulative Preference Shares of £1 each, at cost				851	13	0				852
North Central Wagon and Finance Co. Limited—Cash on Deposit	1,094	1	10							
Cash at Bank—Deposit Account	1,214	9	1							
Cash in hand	23	5	1							
	2,331	16	0							
Less Current Account at Bank overdrawn	181	16	2	2,149	19	10				894
							4,926	3	5	3,360
Publications Reserve Fund Assets										
Duplicator, at cost	32	3	2							
Less Depreciation	23	6	11							
				8	16	3				12
Stock—Map Sets				–	–	–				9
North Central Wagon and Finance Co. Limited Cash on Deposit				1,666	18	5				—
Cash at Building Society and Bank				–	–	–				1,615
							1,675	14	8	1,636
Carried forward							£6,601	18	1	£4,996

THE GEOGRAPHICAL ASSOCIATION

BALANCE SHEET—CONTINUED

31st August, 1958

	£ s. d.	£ s. d.	1957 £
Brought forward		6,601 18 1	4,996
LIFE MEMBERSHIP SUBSCRIPTION FUND			
Balance as at 31st August, 1957	3,082 7 8		3,010
Add Subscriptions received during the year	27 1 6		72
		3,109 9 2	3,082
JUBILEE FUND			
Balance as at 31st August, 1957	1,000 19 10		972
Add Interest for the year	30 13 1		29
		1,031 12 11	1,001
HERBERTSON MEMORIAL FUND			
Balance as at 31st August, 1957	285 18 2		306
Add Interest for the year	8 17 10		9
	294 16 0		315
Less Lecture Expenses	— — —		29
		294 16 0	286
		£11,037 16 2	£9,365

	£ s. d.	£ s. d.	£ s. d.	1957 £
Brought forward			6,601 18 1	4,996
LIFE MEMBERSHIP SUBSCRIPTION FUND ASSETS				
INVESTMENTS				
£1,646 4s. 2d. 3% Savings Bonds 1965/75	1,646 4 2			
£300 0s. 0d. 3% Savings Bonds 1955/65	300 0 0			
		1,946 4 2		1,946
£170 0s. 0d. 3½% Defence Bonds (Conversion Issue 1964)		170 0 0		170
(Approximate Market Value 31st August, 1958 £1,621)		2,116 4 2		2,116
Cave Austin & Company Limited—985 5% Cumulative Preference Shares of £1 each, at cost		755 4 7		755
North Central Wagon & Finance Co. Ltd.—Cash on Deposit		238 19 9		—
Cash at Building Society and Bank		— — —		211
		3,110 8 6		
Less Current Account at Bank overdrawn		19 4	3,109 9 2	3,082
JUBILEE FUND ASSETS				
INVESTMENT, at par				
£820 0s. 0d. 3% Savings Bonds 1965/75		820 0 0		820
(Approximate Market Value 31st August, 1958 £595)				
Cash at Bank—Deposit Account	187 0 11			
Cash at Bank—Current Account	24 12 0			
		211 12 11		181
			1,031 12 11	1,001
HERBERTSON MEMORIAL FUND ASSETS				
INVESTMENT, at par				
£250 0s. 0d. 3% Savings Bonds 1965/75		250 0 0		250
(Approximate Market Value 31st August, 1958, £180)				
Cash at Bank—Deposit Account	37 6 0			
Cash at Bank—Current Account	7 10 0			
		44 16 0		36
			294 16 0	286
			£11,037 16 2	£9,365

We have audited the above Balance Sheet, dated 31st August, 1958, and certify that in our opinion it is properly drawn up so as to exhibit a true and correct view of the position of the Association at that date, according to the best of our information, and the explanations given to us, and as shown by the books of the Association.

SHEFFIELD.
November, 1958.

(*Signed*) HOLMES, WIDLAKE & GIBSON,
Chartered Accountants.
L. DUDLEY STAMP,
Honorary Treasurer.

THE GEOGRAPHICAL ASSOCIATION

INCOME AND EXPENDITURE ACCOUNT for the year ended 31st August, 1958

Dr.

	£ s. d.	£ s. d.	£ s. d.	1957 £
To *Geography*:				
Printing and Publishing		2,429 14 10		1,928
Blocks	90 1 0			
Less Authors' Contributions	34 4 0			
		55 17 0		61
Postages		340 9 4		318
			2,826 1 2	2,307
,, Special Publications:				
Stock at 1st September, 1957		359 10 1		246
Printing		44 5 4		166
		403 15 5		412
Less Stock on hand 31st August, 1958		263 10 10		360
			140 4 7	52
,, Printing and Stationery			163 9 11	186
,, Addressograph			14 3 7	26
,, Insurance			20 13 7	21
,, Salaries—National Insurance			1,723 4 3	1,464
,, Staff Superannuation—Pension Scheme			127 10 0	115
,, Postages—General			286 4 7	264
,, Sundry Office Expenses			25 4 10	19
,, Library Expenses			39 16 9	34
,, Telephone			39 3 6	34
,, Bank Charges			21 18 0	23
,, Publicity			64 5 11	10
,, Officers' Standing Committee Expenses			182 15 11	133
,, Donations and Subscriptions			5 0 0	37
,, Accountancy Charges			63 0 0	63
,, Subventions to Branches			47 6 0	31
,, Depreciation of Office and Library Furniture and Equipment			69 1 11	37
,, Geography Room Survey—Memorandum to Central Advisory Council (Ministry of Education)			— — —	30
,, Repairs and Renewals			13 17 11	—
,, Balance—Excess of Income over Expenditure for the year carried to Accumulated Fund			452 4 2	595
			£6,325 6 7	£5,481

Cr.

	£ s. d.	£ s. d.	1957 £
By Sales of Publications, Maps and Royalties		753 9 5	511
,, Sales of Special Publications		228 4 0	243
,, Advertisements		735 1 0	580
,, Returned Library Postages		53 13 7	69
,, Subscriptions:			
Current	3,949 2 0		3,779
Refund of Income Tax on Covenanted Subscriptions	— — —		—
Arrears	12 16 0		9
		3,961 18 0	3,788
,, Study Courses and Conferences:			
Amount allocated for Administration Expenses		300 0 0	—
,, Interest on Investments and Building Society Deposits:			
(Investments and Deposits held in Life Membership and Accumulated Funds)			
Government Stocks (Gross)	70 6 8		70
Preference Shares (Gross)	112 10 0		94
Bank Interest	71 14 6		—
Building Society Deposits	8 3 11		38
		262 15 1	202
,, Gifts		30 5 6	56
,, Exchange of Publications (U.S.A. Subscriptions)		— — —	2
,, Refund of Costs of Distributions of *Geographers' Reference Book* on behalf of the Geographical Handbook Committee		— — —	8
,, Branches—Returned Funds		— — —	22
		£6,325 6 7	£5,481

THE GEOGRAPHICAL ASSOCIATION

Dr. STUDY COURSES AND CONFERENCES ACCOUNT—INCOME AND EXPENDITURE ACCOUNT for the year ended August 31st, 1958 *Cr.*

	£	s.	d.	£	s.	d.	1957 £
To Expenses of Conferences and Courses				3,353	19	11	3,930
„ Transfer to General Income and Expenditure Account for Administration	300	0	0				
„ Printing and Postages, etc.	39	10	0				
				339	10	0	165
„ Balance, being excess of Income over Expenditure transferred to General Reserve				414	0	0	641
				£4,107	9	11	£4,736

	£	s.	d.	1957 £
By Income from Fees and Advertisements	4,107	9	11	4,736
	£4,107	9	11	£4,736

Reviews of Books

With very rare exceptions books reviewed in this journal may be borrowed from the Library by full members and student library members of the Association.

Pre-famine Ireland: a study in historical geography. T. W. Freeman. 13·7 × 21·2 cm. vii + 352 pp. Manchester: University Press. 1957. 35s.

The population of Ireland increased rapidly from sometime in the middle of the eighteenth century until 1845, an increase that was remarkable because it was in a rural rather than an urban society. Even more remarkable was the decline in numbers which followed during the second half of the nineteenth century, reducing the population of over 8 millions by more than half. The division between these two contrasting conditions is marked by the Great Famine of 1845–48, caused by the complete failure of the potato crop over a number of years. In a well-produced and well-documented book, T. W. Freeman has written a geographical account of the Ireland which existed immediately before the Famine. Apart from its own intrinsic interest, this work is a valuable contribution to the understanding of modern Ireland, since much of the present landscape and society of the country has its origins in this critical period. The value of the book has been further increased by its being published immediately after a study by a group of Irish historians on *The Great Famine*, edited by R. D. Edwards and T. D. Williams, to which it is complementary.

Freeman's book is divided into two parts. First a general account is given of the population, agriculture, trade and industry, communications and social problems of Ireland in the 1840's. The chapter on agriculture is somewhat disappointing, as it contains little direct information on the distribution and nature of the new agricultural techniques being diffused from Great Britain in the mid-nineteenth century. The chapter on population, on the other hand, forms an important contribution, particularly for its reconstruction of population densities in different parts of the country. The second half of the book attempts a regional description. If theoretically acceptable, this plan is not fully satisfactory in practice, since the interpretative and most interesting material is to be found in the general chapters, while the regional section tends to repeat in greater detail what has been dealt with earlier.

The text is generously illustrated with clearly drawn maps, although many of them have no linear scale. Nor is a scale given for the flow lines shown in figures 6 and 19. Figures 2 and 3, which make an interesting comparison between the density of Irish population in 1841 and 1936, unfortunately have been reproduced at slightly different scales. The author has exploited all the worthwhile printed sources for the period, in particular the 1841 census report and the Ordnance Survey maps drawn in the 1830's. He does not seem to have used, however, the memoirs prepared during the Ordnance surveying, which form a valuable if somewhat uneven source. Among secondary sources the most surprising omission from the bibliography is W. F. Adams' classic monograph on Pre-Famine Emigration.

Nevertheless the book remains a careful and detailed account of Ireland in the 1840's, and is a monumental contribution to the scanty literature on the historical geography of Ireland.

J. H. J.

Géographie Rurale de quatre Contrées Celtiques: Irlande, Galles, Cornwall et Man. Pierre Flatrès. 16 × 24·5 cm. 618 pp. + 10 plates + 4 folded maps in pocket. Rennes: Librairie Universitaire J. Plihon. 1957.

Between 1947 and 1953 Pierre Flatrès of the University of Rennes spent considerable time in Cornwall, Wales, Ireland and Man, examining the rural landscape and inquiring into its origins. With a command of English, Welsh and Irish which is the envy of many of his friends in these islands, he has tackled the difficult task of trying to reduce to order the rural geography of these four Celtic countries. Prehistory and the physical environment form the background to his study of the fields, maps and literature of later times. He deals separately with such individual aspects of rural life past and present, as systems of land tenure and land division, farming methods, and types of settlement. He describes such open fields in Wales as Rhossili and Garthbeibio, and deals at some length with clachans and rundale in Ireland. Perhaps one of his most interesting and successful analyses of the landscape is his map showing the "field types" (*structures agraires*) of the four countries. He distinguishes irregular fields; strip fields (*terroirs lanières*); open fields; ribbon fields (*terroirs rubanés*—E. E. Evans' "ladder farms"); large and medium and small regular fields. Though here as elsewhere some details could be argued about, such general features as the great area of large fields in Leinster, or the contrast between field sizes in Welsh Wales and the Marches are well shown. Unfortunately many of the maps are so typically French in their combination of wealth of detail and bad printing that the final results are little short of chaotic. This is especially unfortunate when much new interpretation is being advanced, as in the map of *villages* (the clachans of Evans and his students) in Ireland in the 1830's, classified according to their plans as shown on the 6 in. O.S. maps.

French scholars have long played a distinguished role in the study of Feudal Europe. Flatrès, with his insight into the history and space-relations of western Britain and the Continent, has extended this distinction to the study of Atlantic Europe.

V. B. P.

British Weather in Maps. J. A. Taylor and R. A. Yates. 14·5 × 22·3 cm. xiv + 256 pp. London: Macmillan & Co. Ltd. 1958. 21s.

This attractively produced book is based on part of the first year course in practical climatology for geographers at the University College of Wales, Aberystwyth. It sets out to elucidate British weather by examining about 20 synoptic situations chosen from Daily Weather Reports to illustrate specific air mass, frontal and pressure pattern conditions. Thirty-eight introductory pages are followed by over 200 on the type examples, each example prefaced by general remarks on the type.

Teachers will find the book very useful; but as a class book it has many defects. Despite its authors' disclaimer it is a book on meteorology, and by meteorological standards it is disappointing in content, and inadvisably rigid in approach. A *non sequitur* in the very first sentence presages a regrettable sprinkling with careless errors of fact and argument, and confusing half-truths. Repeated reference to low relative humidity in Polar air at the source "due to the incapacity of air at low temperatures to hold very much moisture" (e.g., pp. 55, 57) raises doubts as to whether lax editing alone can account for imperfections; and, in a book organized like this one, it is especially strange to read of Polar air breaking through the Polar Front (p. 105). There are many similar errors.

Plotted observations, usually for 0600 GMT, and, surprisingly, lacking details of low cloud and tendency characteristic, are accompanied by isopleth maps of eight elements of very varied conservatism, and inset maps of air trajectory, or past isobaric patterns, isobars, collected 'discontinuity lines' (in frontal examples) and selected upper air graphs. As a practical exercise the isopleth method involves a maximum of labour and a minimum of intellectual effort, and might be criticized because it isolates elements which must be considered together. The lengthy descriptions of the isopleth patterns are superfluous, and interpretation is too often tentative, lapsing into vagueness where interesting anomalies occur. These passages are often awkwardly written, with alternating tenses. The treatment of humidity, especially, could be improved.

The examples are well chosen, and rigorous editing of a second edition could set right many deficiencies, and thereby substitute for an unfortunate impression of superficiality an agreeable simplicity. For University teaching purposes some description could well be sacrificed to make room for a simple explanation of layer thickness and pressure level contour charts, for temperature data have to be extracted from the Daily Aerological Record to draw upper air graphs, which in their present form and context have very limited value. At present it is easy to read an ironic symbolism into the remarkable statement that "above the inversion layer there is usually bright sunshine which is partly responsible for the *anticyclonic gloom* at the ground surface below the inversion" (p. 187).

F. A. B.

The County of Anglesey: Soils and Agriculture. E. Roberts. Memoirs of the Soil Survey of Great Britain. Agricultural Research Council. 15 × 24·5 cm. viii + 116 pp. with map in end pocket. London: Her Majesty's Stationery Office. 1958. 10s.

It is appropriate that Mr. E. Roberts, sole surviving member of the Welsh Soil Survey team organized by the late Professor G. W. Robinson at Bangor, should be the author of this memoir. Under the auspices of the Soil Survey of England and Wales, earlier material has been revised and extended. Introductory sections cover physical features, climate, geology and parent materials. Sections follow on soil formation, mapping and classification, and on the soil series themselves. Then agriculture is briefly and rather ineffectually examined, and finally comes a chapter on that part of adjacent Caernarvonshire included in the memoir. Appendices at the end give data from soil profiles and laboratory analyses.

Regrettably, some sections are over-written and contain irrelevancies; e.g. the introduction (p. 11) of unwarranted and unproven geological hypotheses. Other sections are under-written with vital omissions; the climate section for instance is not related specifically to soils or to agriculture.

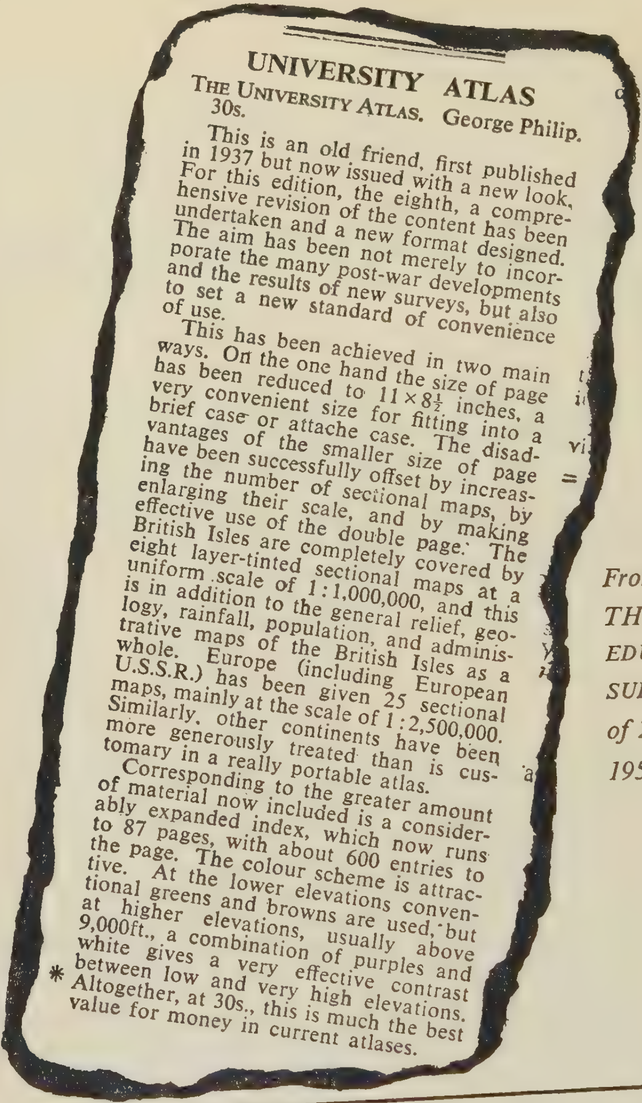
The illustrations, including the one-inch soil map, are commendable, especially the attempts at three-dimensional representation. Expense may be prohibitive but surely the publication of larger-scale maps (e.g. six-inch) would do justice to original field work and enable geographers to have direct access to class sets. The publication of subsidiary maps should also be considered showing the distribution of such individual soil properties as depth, texture and drainage.

This memoir is extremely good value at 10s. and with its five predecessors it should automatically find a place in all geography libraries. It is an invaluable reference work for soil studies at school, college and university level.

J. A. T.

The Glasgow Region: a general survey. British Association for the Advancement of Science. Edited by Ronald Miller and Joy Tivy. 19 × 25·3 cm. xix + 325 pp. Glasgow: British Association. 1958. 30s.

This study of Glasgow and the surrounding area, produced for the 1958 meeting of the British Association, is an attractively presented volume, with illustrations, both text-figures and photographs, of high quality. The survey is undertaken systematically, progressing from physical background through historical aspects to modern economic developments. Each aspect has been dealt with by a specialist who has often incorporated the results of his own research in his account, and the material is therefore drawn from a large number and a wide variety of sources, many of which are inaccessible to the ordinary student or teacher. Thus the book is a most useful addition to existing studies in the regional geography of Scotland, which in general are meagre and many of which are now out of date. It was the Editors'



UNIVERSITY ATLAS

THE UNIVERSITY ATLAS. George Philip. 30s.

This is an old friend, first published in 1937 but now issued with a new look. For this edition, the eighth, a comprehensive revision of the content has been undertaken and a new format designed. The aim has been not merely to incorporate the many post-war developments and the results of new surveys, but also to set a new standard of convenience of use.

This has been achieved in two main ways. On the one hand the size of page has been reduced to 11 × 8½ inches, a very convenient size for fitting into a brief case or attache case. The disadvantages of the smaller size of page have been successfully offset by increasing the number of sectional maps, by enlarging their scale, and by making effective use of the double page. The British Isles are completely covered by eight layer-tinted sectional maps at a uniform scale of 1:1,000,000, and this is in addition to the general relief, geology, rainfall, population, and administrative maps of the British Isles as a whole. Europe (including European U.S.S.R.) has been given 25 sectional maps, mainly at the scale of 1:2,500,000. Similarly, other continents have been more generously treated than is customary in a really portable atlas.

Corresponding to the greater amount of material now included is a considerably expanded index, which now runs to 87 pages, with about 600 entries to the page. The colour scheme is attractive. At the lower elevations conventional greens and browns are used, but at higher elevations, usually above 9,000ft., a combination of purples and white gives a very effective contrast between low and very high elevations. * Altogether, at 30s., this is much the best value for money in current atlases.

From
THE TIMES EDUCATIONAL SUPPLEMENT
of 26th Sept. 1958

* ‘**Altogether, at 30s., this is much the best value for money in current atlases.**’

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intention that each section of the book should stand alone, capable of being read independently; as a result some repetition is inevitable in the book as a whole. While this may occasionally prove irritating, it has the effect of emphasizing certain dominant features of the region which are all too often ignored, for instance the man-made character of the Port of Glasgow—a constantly recurring theme—and the extension of the influence of the city across the three-fold geological division of Scotland.

This survey is both reliable and comprehensive, and as such is to be recommended alike to students of regional geography and to those more narrowly concerned with economic and industrial development. The book is completed by a list of research institutions in the West of Scotland, with brief descriptive notes. J. M. S.

North America: An historical, economic and regional geography. 10th edition revised (1954), reprinted 1957. Ll. R. Jones and P. W. Bryan. 14·5 × 22·5 cm. xvi + 582 pp. London: Methuen & Co. Ltd. 1957. 30s.

This valuable text was one of the really important inter-war geographies and it is in many ways good to see that it remains basically unchanged. It has much to recommend it at the present time. The first section, Historical Geography, retains its high value as a contribution to the subject (one only regrets that it finishes at the Civil War). Part 2, Economic Geography, is a fine example of the application of geographical method, and possesses a clarity and depth that few other texts emulate. Part 3, Regional Geography, contains excellent regional appraisals (not covering the whole area) wherein the sound physical treatment given in earlier sections is admirably supplemented. It must be noted, however, that sections 2 and 3 are somewhat dated in their economic treatment. With reference only to the chapters on coal, Pennsylvania is not now the greatest producer; strip mining is highly important and deserves treatment; Connellsville is not now the "greatest coking centre of the United States" (p. 251); hundreds of rusting locos, standing forlornly in disused sidings, testify that diesel traction has replaced steam on the railways, decimating the "consistently high percentages [of coal] used for locomotive fuel" (p. 273). Other divergencies between the text and the present situation are illustrated by the useful new Statistical Appendix. In its economic treatment, therefore, the book must be regarded mainly as a study of conditions between the wars, a study which is itself of great value. The book still merits a prominent place in the reading of all teachers and serious students of North America. R. C. E.

The Climate of New Zealand: a geographical survey. B. J. Garnier. 22 × 28·5 cm. 191 pp. London: Edward Arnold Ltd. 1957. 70s.

Regional geographers who are making a study of New Zealand are likely to find this superbly produced work agreeable, expensive though it undoubtedly is. Professor Garnier takes the view that Kidson's standard work (in the Köppen-Geiger *Handbook*), published in 1932, needs to be supplemented; and in this reviewer's opinion one of the chief merits of this book lies in the many quotations from more recent papers in authoritative scientific journals, the excellent bibliography, and the up-to-date statistical tables; these will be welcomed by many readers.

The treatment is interesting. Beginning with a general summary of climatic characteristics, the author proceeds to location and the prevalent synoptic situations; in the third chapter physical features are described and their effects upon the atmospheric circulation developed. Regional descriptions follow; to a reader in the north temperate zone these appear to be adequate. There are many agreeable descriptive passages and extracts, and the references to the regional characteristics of the vegetation and soil are welcome. There is a splendidly chosen series of landscape photographs illustrative of the nine principal regions into which the author divides New

Zealand. In general the author sticks to description; hence if comparisons are to be made the reader from Aberdeenshire or Vancouver Island for example will need to have his own data at hand. More attention might be drawn to the effects of the relatively low latitude.

As a whole the work lends itself well to many of the purposes of the descriptive regional geographer. As climatology it fails to answer a variety of questions. Absolute extremes of temperature for example are not provided. There is no discussion of the frequency of thunderstorms. This reviewer could not inform himself about how often snow either falls or lies; he found no adequate comment on Stewart Island; no discussion of any trends that may exist in the New Zealand climate. It is not obvious (p. 171) why a table of mean annual rainfall is given in inches while on the next page potential evapo-transpiration appears in millimetres. Evaporation as such is not mentioned in the index; we might fairly have been told more about whatever measurements exist. We learn nothing about the relationship between cloudiness in Eastern South Island and sea temperature, and more might well be said about the curiously frost-free qualities of the Wellington station (p. 170) by comparison with Te Paki in the far north; is it unrepresentative?

The author in his introduction expresses the intention of his method as "to demonstrate how systematic geography may be more clearly differentiated from the other systematic sciences than is commonly the case". Occasional lapses into the infelicitous jargon of geography, which in this reviewer's opinion appears too often in current writing, will scarcely attract the scientist fresh from Kidson's concise ten-page article in the *Quarterly Journal of the Royal Meteorological Society* for 1937. To say "the region's position as part of North Island . . . gives an essentially North Island stamp to the climate" (p. 129) begs a variety of questions on the part of terse-minded physicists who may well wonder what all the fuss is about. A little more about the rate of change of the climate would be more exciting. However, the scientist will find that the formidable summer cold waves that make cricketers shiver are beautifully illustrated on pp. 118–19. Elsewhere, faced with the table on p. 166 that tells him that in the apparently maritime climate of Invercargill, the October mean after 44 years stands above that for April, he can enjoy himself making his own deductions as to what is really going on there.

Professor Garnier is appropriately conscious of his function as a geographer, and in his 76 pages of actual text it is pleasant to find how often he tells us a good deal about rocks and soils and plants and even a hint of economic history, besides the climate. Providing as it does, in addition to its text, a most useful assemblage of maps, tabular data, synoptic charts and further references, as a library acquisition the book is to be recommended.

G. M.

Aku-Aku. The Secret of Easter Island. T. Heyerdahl. 14·4 × 22 cm. 367 pp. London: George Allen and Unwin. 1958. 21s.

The famous leader of Kontiki led an expedition for a long stay in Easter Island and in *Aku-Aku* he gives a popular account of the studies of the group; this is to be followed as in his earlier publications on Kontiki, by a full scientific discussion. A book for all to read and enjoy, *Aku-Aku* gives the first account of real exploration of the remote island of mystery which is visited once a year by a Chilean warship. Secret caves as family treasure-stores are a great feature, and Heyerdahl gathered not only valuable data as presents from cave-owners but also written material of archaeological interest. The many great statues were studied and a fallen one was re-erected with the immense patience of the native traditional methods. The huge topknots of red stone are paralleled by a topknot of hair on an old drawing. Somewhat analogous statues are found in Mexico, Peru and Bolivia as well as in other islands of eastern Polynesia. The oldest monuments of Easter Island are provisionally dated to 400 A.D. and some of the immigrants were red-haired like some of the Incas of Peru. A much later immigration led to war and the defeat of the earlier group. But to summarize the story would spoil it. Heyerdahl has opened a new era in Pacific Ocean studies that discussion will develop in ways we hardly foresee. May he long continue his inquiries and still write with his accustomed verve and humanity.

H. J. F.

Social Change in the South Pacific. Rarotonga and Aitutaki. E. Beaglehole. 14·5 × 22·5 cm. ix + 268 pp. London: George Allen and Unwin. 1957. 28s.

This work is a most interesting analysis of the processes of social change in the Cook Islands. It is in two parts. The first considers the problem historically and is based on a careful sifting of the London Missionary Society's early records relating to Rarotonga; the second part presents the author's own observations made during an intensive spell of field work in Aitutaki shortly after the second world war.

Geography teachers concerned with projects on Polynesia will find most valuable the sections on the arrival of the missionaries in the first part, and those on village activities, housing, food, entertaining and social change in the second.

E. M. J. C.

The Atlantic. A history of an Ocean. Leonard Outhwaite. 14·5 × 22 cm. 479 pp. London: Constable & Co. Ltd. 1957. 30s.

In recent years a number of books on oceanography has appeared in response to the ever-increasing interest in the subject. This latest book differs from its predecessors in that it covers a much wider field, with chapters not only on the structure and water movements of the ocean, but also on such diverse topics as slaving, whaling and clippers and Atlantic warfare; these give the book its distinctive character, providing a lively and readable account of aspects of Atlantic history not normally covered in the standard textbook.

The introductory physical section is undoubtedly the weakest part of the book; the author has tended to accept statements which have become out of date as the frontiers of oceanography have extended in the last decade or so. Wartime research, in connection with the laying of minefields in the northwest approaches to the British Isles, showed that the well-known Wyville Thomson ridge connects Scotland with the Faeroe Bank and not the submarine plateau from which the Faeroe Isles project. The ridge also comes to within 1000 feet of the surface and not 1500 feet as the author states. The use of feet and not fathoms for depth measurement is also difficult to understand. These minor criticisms should not be allowed to obscure much that is of value in the book, especially as the physical section only accounts for about one sixth of the entire text. Although the paucity of the maps and poor standard of draughtsmanship leave much to be desired, the book still provides an interesting background study of the world's greatest ocean.

A. H. W. R.

Weather Analysis and Forecasting. 2nd edition. Sverre Petterssen. Vol. I. Motion and Motion Systems. 16 × 23·5 cm. xix + 428 pp. 64s. Vol. II. Weather and Weather Systems. 16 × 23·5 cm. xii + 266 pp. 45s. London: McGraw-Hill Publishing Co. Ltd. 1956.

Petterssen's *Weather Analysis and Forecasting* has for the past 15 years been one of the two really indispensable books for the synoptic climatologist and meteorologist. It has been revised to include recent work, especially on the upper air, and is now even more valuable than before.

The second edition, which fully maintains the high standards of both author and publishers, is split into two volumes. Volume I, the larger, discusses the motion of the atmosphere as a whole. The approach is that of the hydrodynamicist. Starting from the basic equations of motion, expressed in vector terminology (an appendix gives the principles of vector analysis), the main features of the wind and pressure fields are deduced. A useful section deals with the vertical structure of wind systems, including the jet stream. The theorems of Bjerknes (circulation) and Rossby (vorticity), and the theory of long waves, are explained in detail. Especially valuable to the geographer are the maps on pages 267 to 276 concerning the average behaviour of cyclones and anticyclones in the northern hemisphere. The development of pressure systems is explained by means of the instability theories and the Sutcliffe development theory. The volume ends with an account of methods for predicting the pressure field by numerically solving the equations of motion.

The basic assumption behind volume I is that weather depends primarily on pressure distribution. Volume II takes into account the frequent exceptions to this rule. This is done geographically in chapter 26, where Bergeron's 1951 model of weather regions is presented, and statistically in chapter 27, which describes methods of local forecasting by means of empirical correlations. The final chapter discusses the application of synoptic climatology to forecasting by fitting mathematical expressions to the form of a pressure surface, and correlating these with local weather elements.

Although the work is not as up to date as one would like on certain synoptic topics, particularly fronts, this is no criticism of the author, who has collected an enormous amount of material into a most convenient summary. Petterssen is the leading authority on kinematic analysis, which is the basis of synoptic climatology and indeed of much of modern forecasting. The treatment is basically mathematical but the books can be read with understanding by the non-mathematician; for the geographer who regards climate as the synthesis of weather, and not just "average weather", they should be essential reading.

E. T. S.

Blackboard Drawing for Geography. The Teaching Aids Series No. 8. J. S. Crichton and G. Rae. 18 × 24·5 cm. 48 pp. Edinburgh: Nelson and Sons. 1958. 3s. 6d.

This book, one of a series on teaching aids, serves a useful purpose by illustrating the many uses of the blackboard in the teaching of geography, and also its limitations. The foreword and introductory notes are brief but helpful for the young teacher. While most points, e.g. those on lettering and sketch-maps, will be endorsed by all teachers, the comments on blackboards appear to be incomplete.

The greater part of the book (42 pages) is taken up with the examples, which are printed white on black and are of varying value. Apart from those which will conflict with the child's own experience, e.g. the daily movement of the sun depicted on p. 8, others will cause uneasiness to those teachers who have a logical approach to the subject. In general the sketch-maps and diagrams carry out the authors' advice and are clear and bold, summarizing essential points. The simple sketches, which can be quickly drawn on the board as new points arise, are also of great value, although some of the physical diagrams have marked inherent faults. The elaborate pictorial representations, which can take considerable time to prepare, have a very limited life on the blackboard and often establish false impressions with children, should have been omitted as being more effectively illustrated by other methods.

For the young teacher the book brings together ideas that most practising teachers of the subject already use.

A. J. G.

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